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Learning from Catastrophe

Quick Response Research in the Wake of Hurricane Katrina



Learning from Catastrophe:
Quick Response Research in the Wake of Hurricane Katrina

Produced by the

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Acknowledgments

This volume is the product of quick response research conducted in the aftermath of Hurricanes Katrina and Rita. The research response to this event was overwhelming as hundreds of researchers converged on the Gulf coast region. Such a concerted effort would not have been possible without the continued support of funding organizations and agencies and, in particular, the National Science Foundation.

In the wake of Katrina's devastation, we extend our sincere gratitude and appreciation to the individuals and organizations who generously offered their precious time and energy to assist these researchers. We hope that the quick response research presented in this volume can help increase awareness and communicate the importance of continuing to learn from catastrophes, such as Hurricane Katrina, to better prepare, respond, recover, and mitigate against present hazards and future disasters.

The Natural Hazards Center would like to thank all of the authors whose work is presented in this volume. Their patience, cooperation, and quick responses were greatly appreciated throughout the production process.

Thanks, too, to the nearly 40 reviewers who dedicated their time and energy to provide critical feedback and suggestions to help strengthen this volume. The peer-review process helps reinforce the scientific rigor and standards of hazards and disaster research.

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I reserve special thanks for Christine Bevc without whose enthusiasm and commitment this volume would have remained a collection of unanswered e-mails, cluttered piles, and draft manuscripts.

— Greg Guibert, Program Manager

Preface

For all the pain, loss, destruction, and suffering that Hurricanes Katrina and Rita caused for residents of the Gulf Coast, the catastrophe presented a rare opportunity for hazards and disaster researchers. Much of disaster research must by necessity be carried out in the aftermath of major events and it is therefore essential that each opportunity to be seized so the appropriate lessons can be learned. The devastation and social and institutional failures wrought by hurricanes Katrina and Rita, unfortunately, provided ample fodder for quick response research.

Since 1986, the Natural Hazards Center has operated its own small grant program for quick response research, with support from the Infrastructure Management and Hazard Response Program of the National Science Foundation (NSF). Each fall, the Center asks members of the research community to submit proposals describing research they plan to conduct in the coming year, should disaster events occur that match their research interests. Grants are very small—typically no more than $3,000—and are intended primarily to provide support for travel and basic data collection expenses. Faculty members are encouraged to use their funds to bring students and junior investigators into the field. To date, a total of 186 quick response studies have been carried out.

The two largest Center funded efforts have taken place in the last five years. The first, following the terrorist attacks of September 11, 2001, included more than a dozen rapid-response data collection efforts. The 2003 publication *Beyond September 11: An Account of Post-Disaster Research* is a compilation of 22 papers developed out of research activities sponsored by the Center, NSF Small Grants for Exploratory Research (SGER) funds, and NSF grant supplements. The second funding effort followed Hurricane Katrina in September and October of 2005. The Center funded 25 teams—its largest activation ever. Small grants were awarded to investigators and students from 16 universities and two independent research groups. Teams focused on a wide array of topics, including emergency management and intergovernmental relations; responses by mass media organizations; evacuation processes; family networks in evacuation and sheltering; patterns in postdisaster looting; the provision of services to pets; and search and rescue issues. Universities and other institutions from across the country also

made funding available. In most cases, research conducted in the immediate post-impact period served as a foundation for lengthier, in depth study.

Why Is This Research Important?

The reasons for conducting rapid response research are very much the same regardless of the disciplines involved. The rationale for such studies centers on the importance of obtaining perishable data of all types in the context of disaster events. Engineers conducting postearthquake reconnaissance want to be on the scene to directly observe the physical damage caused by disasters before clean-up efforts begin. Social scientists want to conduct field work as soon as possible after disaster strikes in order to directly observe social and organizational processes as they emerge, develop, and evolve. While some forms of data, such as data on economic impacts, are only available some time after disasters, other types of data can only be collected while disaster response is ongoing. The ability to be on the scene during the emergency period following disasters gives researchers direct access to information on crisis decision making, the manner in which responding organizations coordinate their response activities (or fail to), how civil society groups mobilize during disasters, victims' experiences with emergency service providers, and other topics of interest in real time. In many cases, the phenomena studied by disaster field workers are ephemeral; if not captured and documented during the emergency period itself, they are forever lost to the research community.

The ability to conduct research in the context of disasters improves the validity of research findings, again regardless of the disciplines involved. For engineers, there is a need to be sure that impacts on structures are a direct result of the action of extreme events, rather than due to other causes. Social scientists seek to observe events directly and engage in informal interviews during disaster events because memories fade and information gets distorted over time. For example, organizational accounts prepared after the fact may leave out key pieces of information, either because the information was not properly recorded or because officials decide to leave it out.

Major disaster events put extreme pressures on both victims and responders. There is such confusion, so many actions are undertaken rapidly, so many options explored, and so many decisions made that those involved in disasters may have difficulty recollecting exactly what happened during a disaster if asked weeks or months later. Under disaster-induced pressure, many decisions and actions are not formally documented and thus are unavailable except through direct observation. Records may be transient (e.g., notes on white boards), which is another justification for rapid data collection. For all of these reasons, it is a general tenet of disaster research that data collected through direct observation and on-the-scene field

work provide more valid answers to some research questions than data collected after time has been permitted to pass.

Quick response studies are also important because such studies frequently result in the identification of questions for future, longer-term research. Disasters inevitably bring surprises, and quite often those surprises turn into researchable topics. For example, rapid postdisaster research following Hurricane Andrew highlighted the role of groups that emerged to address the specific needs of women victims and stimulated further research on questions related to gender and disaster. Field work immediately following the World Trade Center attack led to the discovery of numerous forms of informal group mobilization, which were explored in subsequent larger-scale research projects. Hurricane Katrina, the subject of this monograph, brought to the fore new questions regarding the intersection of disaster events and axes of social inequality such as social class and race, as well as questions regarding overall U.S. preparedness in the post-September 11 era.

Field Work Following Katrina

Because of the multiple severe impacts and the utter devastation caused by Hurricane Katrina, rapid response field work was especially challenging—perhaps more so than in any recent U.S. disaster. With extensive transportation system damage, mountains of debris, insufficient gasoline, utility outages, few accommodations, and food and water shortages, the logistical challenges alone were enormous. One team brought food, water, and camping gear into the field. Another researcher traveled through devastated neighborhoods by bicycle, and went on to gather data on the role of bicycles in the provision of emergency aid. Yet another returned from the field earlier than expected, having suffered a collapse due to insufficient water and extreme heat.

But worse than the physical discomfort, field teams also found themselves face-to-face with the storm's human toll and the pain, frustration, and despair of Katrina's victims. One of the hallmarks of the Katrina catastrophe is how the hurricane exposed inequities of all types—most notably those associated with race and class—and manifested a vicious form of "social triage" in which the most needy were accorded the least attention. In this case, the pain of victims was exacerbated by a second disaster: the near total collapse of local, state, and federal disaster response systems. Field workers witnessed catastrophe and its depredations first hand and are now bringing the human story of Katrina to a wider audience through the publication of this edited volume.

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Acronym List

ASCE	American Society of Civil Engineers
ASNE	American Society of Newspaper Editors
B-LLP	Barrier-Low Level Plan
BOB	Bureau of the Budget
CB	Citizen Band
CCM	Constant Comparison Method
CCT	communications and computing technology
CEO	chief executive officer
COO	chief operations officer
DHS	Department of Homeland Security
DMAT	Disaster Medical Assistance Team
DOD	Department of Defense
DRC	Disaster Research Center
DTF	Debris Task Force
ED	emergency department
EIS	Environmental Impact Statement
EJGH	East Jefferson General Hospital
EMTs	emergency medical technicians
EOC	Emergency Operating Center
EPA	Environmental Protection Agency
ESFs	emergency support functions
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration

GHQ	General Health Questionnaire
GLBTQA	gay, lesbian, bisexual, transgendered, questioning, and asexual minorities
GPA	grade point average
HCA	Hospital Corporation of America
HLP	High Level Plan
HTF	Hurricane Taskforce
ICC	incident command centers
ICS	Incident Command System
ICT	information and communications technology
IES	Impact of Event Scale
IHNC	Inner Harbor Navigation Canal
IMR	Internet-Mediated Research
IMS	Incident Management System
IPET	Interagency Evaluation Task Force
IT	information technology
JFO	Joint Federal Office
LPB	Louisiana Public Broadcasting
LPHPP	Lake Pontchartrain Hurricane Protection Plan
LSU	Louisiana State University
MCEER	Multidisciplinary Center for Earthquake Engineering Research
MREs	meals ready to eat
MRGO	Mississippi River Gulf Outlet
MSU	Mississippi State University
NIMS	National Incident Management System
NOAA	National Oceanic and Atmospheric Administration
NOE	New Orleans East
NOPD	New Orleans Police Department
OLB	Orleans Levee Board

OPP	Orleans Parish Prison
OSIS	Open Specification for Sensitive Information Sharing
PRTs	Planning and Response Teams
PTSD	post traumatic stress disorder
RAINS	Regional Alliances for Infrastructure and Network Security
REs	responsible engineers
SAR	search and rescue
SPH	Standard Project Hurricane
SSRC	Social Science Research Center
TBI	traumatic brain injury
TDSRs	temporary debris storage and reduction sites
UHS	Universal Health Services
USACE	U.S. Army Corps of Engineers, the Corps
USAR	Urban Search and Rescue
USWB	U.S. Weather Bureau
USWRC	U.S. Water Resources Council
VA	Veterans Administration
West Jeff	West Jefferson Medical Center
WRDA	Water Resources Development Acts

Part 1:

Introduction

Introduction

Over the years, New Orleans and communities along the Gulf Coast have developed a "disaster subculture" that includes "those adjustments, actual and potential, social, psychological, and physical, which are used by residents of such areas to cope with disasters which have struck or which tradition indicates may strike in the future" (Moore 1964: 195; Anderson 1965; Forrest 1979). Reports and predictions over the years agreed that should a major hurricane make landfall on or very near New Orleans:

- The levees would fail and the "bowl" would flood to a depth of 20 to 25 feet in some places. The pumps would take weeks to remove the water.
- Many New Orleanians would be unable to evacuate, leaving behind thousands to ride out the storm in their homes and face the storm surge. When the storm surge came, many would climb onto their roofs and wait to be rescued.
- The death toll would be over one thousand.
- The economic impact would be felt across the country as the fifth largest port would be closed and seafood, natural gas, and oil industries would be significantly affected. The estimated cost of the disaster would be in the billions of dollars (Fischetti 2001; Bourne 2004; Laska 2004).

In late August 2005, those predictions were put to the test. Within 48 hours Hurricane Katrina developed from a tropical depression into a hurricane off the coast of south Florida. By the end of that second day, Hurricane Katrina had crossed the southern tip of the Florida peninsula and entered the warm waters of the Gulf of Mexico. The following day (Friday, August 26) the National Hurricane Center released a forecast model that predicted Katrina would strike east of New Orleans around Buras, Louisiana, a small town with a population of fewer than 3,500 people (National Hurricane Center 2005a). Over the weekend, Katrina grew into a powerful Category 5 storm on the Saffir-Simpson scale (National Hurricane Center 2005b). By Sunday, the storm, with sustained winds of 175 miles per hour, had the ability to destroy buildings and create a storm surge 18 feet above normal (National Hurricane Center 2005c). Only three storms in history had ever made landfall as a Category 5 (the Labor Day Hurricane of 1935, Hurricane Camille in

1969, and Hurricane Andrew in August 1992) (Blake, Jarrell, and Rappaport 2005). Hurricane Katrina traveled across the Florida peninsula into the Gulf of Mexico, and then turned north heading to make landfall east of New Orleans following a similar path to Betsy (1965), Camille (1969), Andrew (1992), and Georges (1998).

Before landfall, Louisiana's Governor Kathleen Blanco declared a state of emergency. The next day (Saturday), President Bush declared Louisiana a major disaster area, an unprecedented move that made resources available before the event. By Monday, Mississippi and Alabama joined Florida and Louisiana with major disaster declarations. Many residents were able to evacuate affected areas, while states receiving evacuees declared a state of emergency. However, thousands of residents were unable to evacuate and many made their way to "shelters of last resort," such as the Superdome and the New Orleans Convention Center.

As Katrina made landfall, the storm surge reached up to 25 feet in areas along the Gulf Coast. In addition, three levees failed when the storm surge pushed Lake Pontchartrain over their tops. As a result, over 80 percent of New Orleans was flooded, with some areas at depths of 20 feet. Many of those unable to evacuate the city were trapped on their roofs or in shelters. In the days that followed, the military mobilized one of the largest deployments ever of National Guard and active forces in the United States. By mid-September nearly every state in the continental U.S. had declared a state of emergency, thereby making them eligible to receive aid to help with more than one million displaced residents.

Contributions to this Volume

Learning from Catastrophe consists of eighteen chapters comprising contributions from researchers representing various social science disciplines and from senior scholars and young investigators, including graduate students. The chapters are organized by theme into four major parts: the making of a disaster, the culture of disaster and social vulnerability, the issues in disaster response, and the individual and collective experience. David Moreau leads off with a discussion of the physical vulnerability of New Orleans with his chapter entitled "Levees and Land Use: The Making of a Disaster in New Orleans." He outlines how approaches to the design and construction of flood control works in a flood- and hurricane-prone region, combined with patterns of land use and development and a sequence of laws and regulations, set the stage for the Katrina catastrophe.

The next section of the book, consisting of five chapters, focuses on vulnerability, diversity, and the social-structural sources of disaster victimization. The first chapter in this section, by John Barnshaw, discusses the relevance of sociological theories and concepts, such as structuration theory, theories of social inequality, and

the concept of social capital, for understanding vulnerability and victimization in the Katrina disaster. Based on extensive interviews with primarily African American evacuees, Barnshaw argues that disasters may best be viewed through the lens of social stratification, in that disaster losses and experiences are tied closely to axes of inequality such as race and social class. Exploring victims' and volunteers' representations of their experiences in weblogs, Ann Myatt James and Tarek Rashed find that disaster-related blogs constitute a fruitful area for investigation. Although expecting to see gender differences in perceptions of Katrina disaster, they found that men and women victims voiced similar fears and concerns about inequitable treatment at the hands responding agencies, and relief workers felt the same way. Evidently Katrina was an event that, at least temporarily and at least for these bloggers, was experienced in consistent ways by men and women. Alice Fothergill and Lori Peek report on their research on children in the Katrina disaster, noting that the experiences of children and youth are rarely addressed by disaster researchers. Fothergill and Peek document children's experiences with evacuation, new school and day care arrangements, and other unfamiliar situations with which children were forced to cope. The chapter contains many insights on how children are both vulnerable and resilient in the face of disasters.

Although addressed in other chapters in this section, as well, ethnicity and race are the main focus of chapters by Jenniffer Santos-Hernández and by Duke Austin and Michele Miles. In "Losing Everything," Santos-Hernández details the experiences of undocumented Latino workers affected by Katrina. A Latina herself, Santos-Hernández noted the presence of many Spanish-speaking victims in shelters and began interviewing them in Spanish. Her research account documents how Latinos lacked adequate warning information in the period leading up to Katrina's landfall and how their undocumented status affected their experiences during and after the hurricane, particularly with respect to obtaining needed assistance. Fears of discovery and deportation compounded the anguish for Latinos, who hid from government officials until their situations became desperate. In "Crisis in Black and White," Austin (a white male) and Miles (a black woman) explore how racial identities shaped victims' perceptions of events as they unfolded during the catastrophe. Using a social constructionist framework, the authors argue that blacks and whites constructed starkly different realities as they attempted to make sense out of what they were hearing, seeing, and experiencing after Katrina struck. Whites constructed images of dangerous black males, felt threatened, and believed that disaster aid was color-blind. Blacks felt unfairly criminalized and saw race and racism as key factors in the unequal treatment accorded to blacks during and after the disaster.

The next section of the volume, entitled "Issues in Disaster Response," contains contributions that focus on organizational and collective behavior in the Katrina

catastrophe. This part begins with "Critical Care in Crisis," a discussion by Daniel Hess and Lucy Arendt that focuses on how acute care hospitals responded to the threat and impacts of Katrina. The chapter documents the many challenges hospitals faced, including difficulties with envisioning how the hurricane and subsequent flooding would affect hospital facilities; total loss of communication with the outside world; and massive difficulties with evacuating patients. One of the authors' sobering conclusions is that hospitals should plan to be self-sufficient for an extended period of time following a major disaster.

Various forms of collective behavior have been studied in the context of disasters. One type of collective behavior, looting, has generally been thought to be extremely rare in U.S. disasters, although common (and condoned by most community residents) in episodes of civil disorder. Indeed, the idea that looting is a problem in disasters is commonly considered a myth. Lauren Barsky, in her chapter "Disaster Realities Following Katrina," explores the discrepancy between social science findings on disaster looting and the widespread instances of looting behavior that were reported by the media following Katrina. She finds that the seizure of property in disasters and other crises is subject to different interpretations; what some view as stealing, others view as "appropriating behavior," or the justifiable taking of items necessary for survival. She also argues that looting in both disasters and civil unrest can be viewed as a form of protest against social inequities.

Emmanuel David presents data on a second type of disaster-related collective behavior: pro-social behavior undertaken by emergent groups. Because Katrina was such a severe disaster, spontaneous volunteering and the formation of new groups seeking to address disaster-related problems were widespread throughout the impact region. In "Emergent Behavior and Groups in Postdisaster New Orleans," David finds that while some emergent group activities followed patterns that are quite common in disasters, such as providing care to victims, other groups took on tasks that were not as typical, such as observing and documenting instances of unfair treatment of disaster victims by the police. This research shows the extent to which this disaster generated both supportive and contentious collective action.

Under the new National Response Plan (NRP), the National Incident Management System (NIMS) constitutes the mandatory framework for organizing disaster response activities. NIMS is based on an earlier approach to managing disaster operations known as the incident command system (ICS). Researchers have studied both ICS and NIMS in the context of disaster events, but as David Neal and Gary Webb point out in their chapter, "Structural Barriers to Implementing the National Incident Management System during the Response to Hurricane Katrina," the effectiveness of these frameworks in organizing responses to disasters has never actually been demonstrated empirically. As they show, NIMS and ICS were used

in only a limited way in the governmental response to Hurricane Katrina, and many organizations involved in the response were completely unfamiliar with those concepts. They highlight a number of existing impediments to the wider use of NIMS/ICS, including training issues and organizational cultures. One critical weakness of NIMS/ICS is its lack of attention to the informal dimensions of organizational and interorganizational collaboration, as opposed to formal organizational arrangements.

In "Hurricane Katrina Debris Removal Operations," David Mendonça and Yao Hu present preliminary results of his research on the organization of Katrina debris removal operations in Southern Mississippi, with a special emphasis on the role of communication and computing technology (CCT) in the performance of this key disaster task. Using the theory of "task-technology fit," he examines the conditions under which different types of technologies are likely to improve the performance of different tasks associated with debris management. While confined only to tasks associated with debris removal, Mendonça and Hu's approach can be used to explore other disaster-related tasks that are dependent on CCT.

The fifth section of the volume, "Individual and Collective Experience," consists of a series of chapters that focus on differently situated groups affected by the Katrina catastrophe. In "There for the Storm," Joseph Trainor, William Donner, and Manuel Torres document the experiences of hurricane victims who did not evacuate when Katrina struck. Based on their interviews, the authors found that remaining in their homes was often the only alternative for some victims, that those who stayed may have learned the wrong lessons from their past hurricane experiences, that many "normalized" warnings refused to recognize the severity of the threat; and that social bonds played a role in evacuation decisions. Lisa Harrington, Joye Gordon, and Bimal Paul studied evacuation decision making and the timing of evacuations among residents of seven southeastern Louisiana parishes by conducting nearly 350 interviews, primarily with shelter residents. Their findings are generally consistent with other studies that point to the importance of such factors as gender, race, income, and pre-event household evacuation planning in evacuation decision making. Some of their findings, for example, that age and the presence of children and pets in the home tended not to predict evacuation decisions and timing, are counterintuitive. Interestingly, low levels of trust in local and state government were associated with "late" evacuation—that is, evacuation after Katrina made landfall. The authors were able to compare their Katrina survey results with other data that were collected by the Southeast Louisiana Task Force in 2004.

Marguerite Moritz interviewed newspaper, radio, and television journalists from New Orleans, as well as residents who relied on the media for information during

the disaster. Her chapter, "Covering the News 'come hell and high water,'" focuses on a number of important topics, such as the extent to which news organizations in the impact area had planned for disasters, the nearly insurmountable difficulties journalists faced in attempting to report on Katrina, the pressures journalists felt in covering a multi-faceted story of such enormous size and significance; and the ways in which media organizations adopted innovative ways of getting out the news. Also discussed are the issues of media bias and African Americans' reactions to racially coded news reporting.

Colleges and universities were among numerous institutions that were hit hard by the Katrina catastrophe. Many tens of thousands of students were forced to relocate at least temporarily, and a substantial subset of those evacuees spent the 2005–2006 academic year in other institutions. Duane Gill and his collaborators report preliminary findings from a survey on over 3,000 Mississippi State University students that documents how those students were affected by Katrina. Their chapter discusses a range of impacts experienced by students, including financial, health, and psychosocial impacts, as well as how the hurricane experience affected academic performance.

In their chapter, Tisha Slagle Pipes and Jarrod Kundson analyze Katrina as an "information disaster"—that is, as an event that cut people off from the information sources and technologies on which they depend. The authors interviewed Katrina victims in the city of Slidell, Louisiana, exploring their experiences with sudden "information poverty" and their efforts to salvage information in the same sense they sought to salvage food and other supplies. Their study shows how, in an information age, the loss of trusted information sources and technologies places additional stress on disaster victims and further erodes their ability to cope. At the same time, disruption of information channels leads to increased reliance on informal sources of information and word-of-mouth communication.

Like other forms of individual and collective trauma, disasters inevitably stimulate collective sense making efforts aimed at framing events, their causes, and their consequences. Narrative and "storytelling" develop in a variety of contexts: among government officials and spokespersons, media organizations, and, importantly, among victims themselves. Official and media narratives dominate discourse during disasters and drown out the voices of ordinary people, just as they do during normal times, but events like Katrina also give rise to powerful counternarratives. In "Voices from the Astrodome and Beyond," Gregory Button explores common counternarratives that emerged in the aftermath of Katrina—narratives of fear, loss, and damaged pride, narratives of suspicion, victimization ("they blowed the levees"), and the hidden injuries of race.

With respect to dominant narratives, the final chapter in this volume, by Vincent Gawronski, Richard Olson, and Pedro Carvalho, addresses how different print media constructed narratives regarding the origins and impacts of Katrina. Such "causal stories" are significant in part because they define or construct public problems and subsequently shape policy agendas. Of key concern for the authors is the extent to which media narratives identified root systemic forces, such as development pressures, as opposed to technical and organizational factors, such as inadequate preparedness and response efforts. One interesting pattern they uncovered was that local media in the impact region were much less likely than national media to focus on the root causes of the Katrina catastrophe.

In all, this volume is the product of quick response research following Hurricane Katrina. Its goal is to share these experiences, observations, and research findings with the broader community. As the Gulf Coast continues its long recovery, the research presented here may help these and other communities, along with state and federal government, learn from this catastrophe.

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Part 2:
Making of a Disaster

Levees and Land Use: The Making of a Disaster in New Orleans

David H. Moreau
University of North Carolina at Chapel Hill

Abstract

History shows that flooding disasters in New Orleans have followed a repetitious cycle of expansion of urban development, construction of protection measures to protect against the most recent flooding, and failure when the next larger storm occurs. This chapter reviews several of those cycles leading up to development of the system of levees and floodwalls that were in place when Katrina struck the city in 2005. The plan for that system, known as the Lake Pontchartrain Hurricane Protection Plan (LPHPP), was formulated as a flood control project by the U.S. Army Corps of Engineers (USACE) in the early 1960s; it was authorized by Congress in 1965 and modified in 1984 and the early 1990s. Special attention is given to the criteria that guided formulation and evaluation of the plan and urban development that followed its implementation. A concluding discussion covers several lessons that could and should be learned from this disaster, including underestimation of risk, inappropriate criteria for protecting the hundreds of thousands of people who are at risk from a single event, overreliance on 50-year forecasts of land development to justify projects, and construction of parts of the project 50 years in advance of highly uncertain needs.

Keywords: hurricane protection, history, levees, Katrina, land use

John McPhee, in his book *The Control of Nature* (1989), quoted the narrator of a film prepared by the U.S. Army Corps of Engineers (USACE) that showed

structures built to keep the Mississippi River in its present channel as it flows through South Louisiana. The speaker says, "This nation has a large and powerful adversary. . . . We are fighting Mother Nature . . . It's a battle we have to fight day by day, year by year." If that is the case, Mother Nature won and the Corps and the city of New Orleans lost an historic battle in late August 2005 when Hurricane Katrina destroyed much of the protective levee-floodwall system.

Although the Corps' structural failures were very important contributors to the Katrina disaster, they are only one part of the problem. The other part is urban development in high-hazard areas. For nearly three hundred years, more and more people moved into harm's way, building homes and businesses in high risk areas. Urban development and construction of flood control and drainage facilities in and around New Orleans have gone hand in glove, and Katrina was not the first time structures failed to protect people living behind them. First, it was the Mississippi River flooding that threatened and frequently damaged the city. Then, as urban development spread into reclaimed wetland areas nearer surrounding lakes, hurricane-driven storm surges posed an ever-increasing risk to life and property. Structures that were built to reduce flooding, improve navigation, provide urban infrastructure, and exploit oil resources have resulted in land subsidence that has aggravated the situation. Flooding disasters in New Orleans follow a repetitious cycle of urban development, followed by construction of protective barriers, followed by hurricanes and floods that have overwhelmed the barriers.

This chapter reviews several of those cycles with special attention to the protective system and related urban development in place prior to Katrina. The discussion begins with a brief review of the physical geography of New Orleans, including the general geographical setting, land profiles, and the history of hurricanes. Brief historical sketches of urban growth, development of levees, and construction of the drainage system are presented to set the background for the Lake Pontchartrain Hurricane Protection Plan (LPHPP), formulated by the Corps in the early 1960s, authorized by Congress in 1965, and largely completed before 2005. Corps activities related to that project, including rebuilding Katrina-damaged levees and floodwalls, still operate under that authority. One historical sketch covers the period prior to 1900 when urban development was still primarily limited to high ground along the Mississippi River. A second sketch covers the period 1900–1950 when development spread into low-lying areas toward Lake Pontchartrain. During that period, damages from hurricanes increased dramatically; local and state government initiatives to reduce damage from hurricanes and intense rainstorms are reviewed. Those historical sketches set the stage for a discussion of federal government involvement. Special attention is given criteria for the formulation and evaluation of the LPHPP, its modifications in 1984, and additional protection along the drainage canals in the early 1990s. Urban development that followed

implementation of the plan is examined in the light of projections and assumptions about land use in the 1965 plan. The concluding section of the chapter suggests several lessons that should be learned from the Katrina disaster, which left hundreds dead, hundreds of thousands displaced for extended periods, and billions of dollars in property damage.

Physical Geography

General Setting

As illustrated in Figure 1, a city could hardly be located in a place more susceptible to flood hazards than New Orleans—floods from one of the world's largest rivers and storm surge from devastating hurricanes that frequent Lake Borgne to the east and Lake Pontchartrain to the north. Even tropical rains that frequent the city pose a serious but less dramatic challenge to the pump-dependent drainage system for disposal of stormwater.



FIGURE 1: Major Water Bodies and Political Boundaries in the New Orleans Metropolitan Area

The city is coterminous with Orleans Parish. It is part of the Metropolitan Statistical Area defined by the U.S. Bureau of the Census in 2000 that also includes Jefferson, St. Bernard, St. Charles, Plaquemines, St. Tammany, and St. John the Baptist Parishes. The land area within Orleans Parish is 181 square miles. About two-thirds of the parish is in an area generally referred to as New Orleans East. That part of the parish is bounded on the west by the Inner Harbor Navigation Canal (IHNC) and on the south by that portion of the border between Orleans and St. Bernard Parishes that roughly parallels latitude 30°N.

Topography

Several features that are significant to hydrology in and around New Orleans are shown in Figure 2. The city is bounded on the west by the 17th Street Canal. That canal, along with the Orleans Street and London Street canals and St. Johns Bayou, are key elements of the drainage system that carries stormwater out to Lake Pontchartrain. The IHNC, often referred to as the Industrial Canal, was built just prior to World War I to facilitate the movement of ocean-going vessels and barge traffic along the Intracoastal Waterway. Another significant feature is the Mississippi River Gulf Outlet (MRGO), a 76-mile, 36-foot-deep, 500-foot-wide emergency

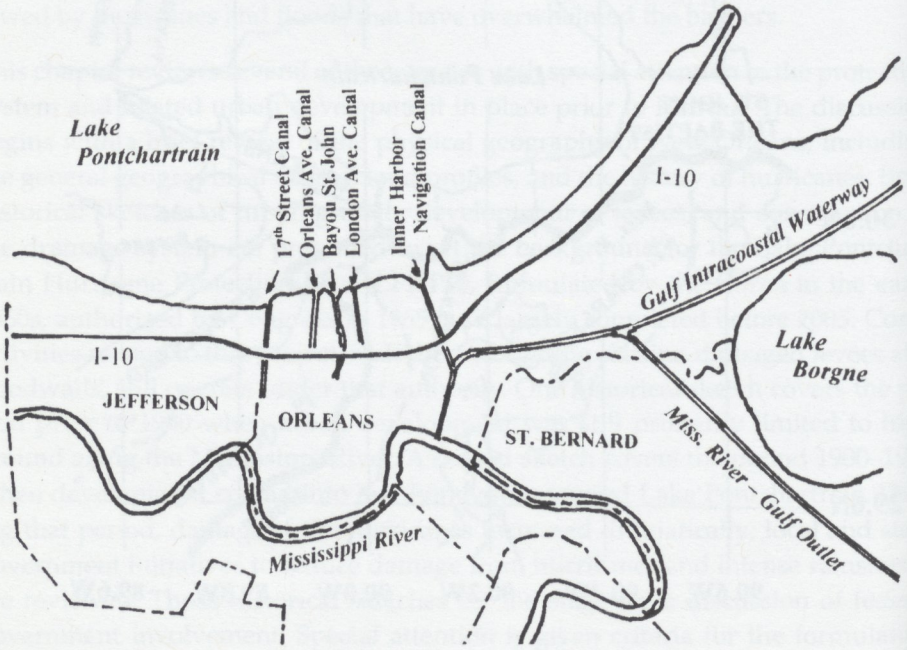


FIGURE 2: Selected Water Related Features in New Orleans and Vicinity

waterway that links the Port of New Orleans and the Gulf. First authorized by the Rivers and Harbors Act of 1956 and opened to traffic in 1965, it was billed as being shorter and safer to the Gulf than the Mississippi River. MRGO has figured prominently in debates about environmental issues and possible aggravating factors during Katrina. Yet another useful landmark is Paris Road that transects New Orleans East. It is significant in tracking the extent of development in that area.

A large portion of the city is below sea level. Figure 3 shows a surface profile of a section of the city from the Mississippi River to Lake Pontchartrain along Canal Street. There is "high" ground near the river, a result of the deposition of a natural levee built up over the ages from periodic flooding of neighboring lands. The low point along that line is about eight feet below sea level. Mean annual maximum stage of the Mississippi River is 11 feet above sea level. The standard project flood for design of the Mississippi River levees is 14 feet, and the standard project storm surge for Lake Pontchartrain used to design the lakefront levees in 1965 is 11.5 feet.

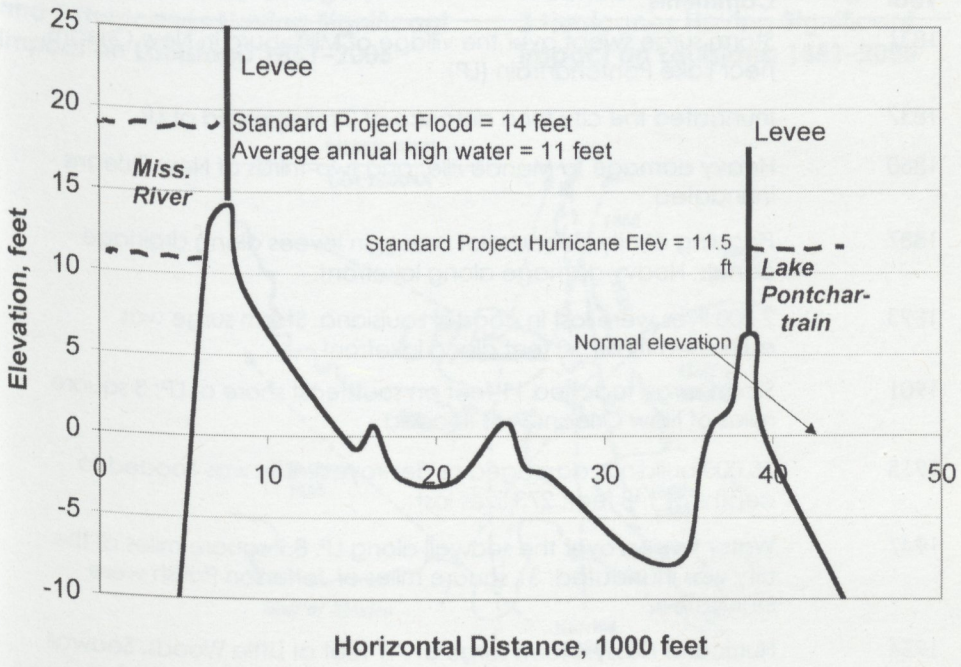


FIGURE 3: Profile of Ground from Mississippi River to Lake Pontchartrain

Hurricanes and Related Flooding

Hurricanes that threatened the low-lying areas are frequent visitors to New Orleans. One record of severe storms to hit the area from 1722 to 1961 was compiled by the Corps from a variety of sources (U.S. House of Representatives 1965). The storm of 1722, five years after the city was founded, did severe damage to the church, homes, stores, and crops. That was repeated a year later. The Corps reported that the city was "struck" 40 times over the period 1723–1961, an average frequency of about once every seven years. Only partial data about characteristics of these storms is available. Comments by the Corps on some of the more notable storms are summarized in Table 1.

A more systematic database of hurricanes that have struck Louisiana has been compiled by the National Oceanic and Atmospheric Administration (NOAA). That list includes 48 hurricanes that have had a significant impact on Louisiana over the period 1851 to 2004 (Blake et al. 2005). There were 43 years in which at least one hurricane struck the state, 19 in which a major storm (Category 3, 4, or 5)

TABLE 1: Significant Storms Noted by the U.S. Army Corps of Engineers Prior to 1965

Year	Comments
1831	Storm surge swept over the village of Milneburg in New Orleans, near Lake Pontchartrain (LP)
1837	Inundated the city for a distance of 2 miles inland of LP
1860	Heavy damage to Mandeville; and two-thirds of New Orleans inundated
1887	Flooding of city because of breaks in levees along drainage canals. Heavy damage along lakefront.
1893	2,000 lives were lost in coastal Louisiana. Storm surge was estimated to be 10 feet along lakefront
1901	Storm surge reached 11 feet on southeast shore of LP; 3 square miles of New Orleans was flooded
1915	25,000 buildings damaged or destroyed. City was flooded to depths of 1–8 feet. 273 lives lost
1947	Water flowed over the seawall along LP. 8.9 square miles of the city was inundated; 31 square miles of Jefferson Parish were inundated.
1956	Hurricane Flossy. Storm surge of 7.1 feet at Little Woods. Seawall was overtopped; 2.5 square miles of city were inundated.

Source: U.S. House of Representatives 1965.

occurred. Only one Category 5 hurricane, Camille in 1969, is in that record. Hurricanes of 1856, 1893, 1915, and 1957 have been classified as Category 4. Category 3 hurricanes occurred 14 times. Approximate tracks for those storms are shown in figures 4 and 5. Approximate tracks for Category 3, 4, and 5 hurricanes that have passed within 50 miles of the reference point in New Orleans at Longitude 90°W and Latitude 30°N are shown in Figure 6.

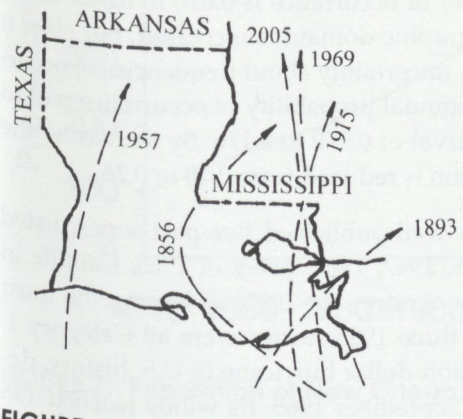


FIGURE 4: Tracks for Category 4 and 5 Hurricanes Having Significant Impact on Louisiana 1851–2005

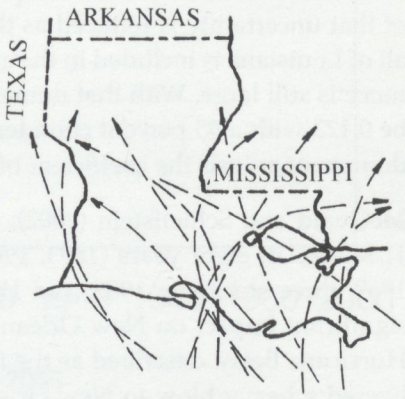


FIGURE 5: Tracks for Category 3 Hurricanes Having Significant Impact on Louisiana 1851–2005

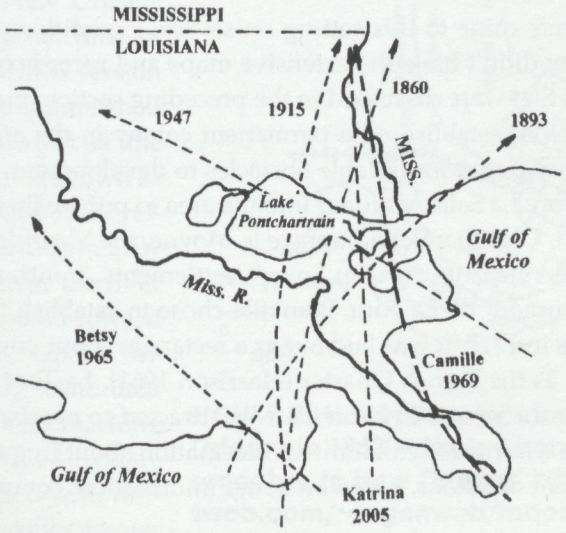


FIGURE 6: Category 3, 4, and 5 Hurricanes within 50 miles of Longitude 90°W and Latitude 30°N

Because of the relatively small number of major storms that have come close to New Orleans, considerable uncertainty surrounds estimates of storm frequencies by individual categories. If occurrence of a major hurricane each year is assumed to be a random event that follows a binimial distribution, then the estimated mean probability of occurrence within 50 miles of New Orleans (90°W, 30°N) would be 0.052 or 5.2 chances out of a hundred. The average return interval is about 19 years. Although that may be the best estimate, it is uncertain. There is a 95 percent confidence that the annual probability of occurrence is 0.010 to 0.093. Some of that uncertainty is reduced as the geographic domain is increased, but even if all of Louisiana is included in the analysis, uncertainty about frequencies of occurrence is still large. With that domain, the annual probability of occurrence would be 0.123 with a 95 percent confidence interval of 0.070 to 0.176. By increasing the domain of anlysis the coefficient of variation is reduced from 0.40 to 0.26.

McQuaid and Schleifstein (2002), in their well-publicized five-part series, listed 11 storms in eight years (1893, 1909, 1915, 1947, 1964, Betsy in 1965, Camille in 1969, three storms in 1985, and Hurricane Andrew in 1992) as having the most significant impact on New Orleans.. The three 1985 storms were all Category 1. Hurricane Betsy, described as the first billion-dollar hurricane in U.S. history, delivered a heavy blow to New Orleans in September 1965. Its winds reached 135 miles per hour (NOAA 2005). It caused massive flooding in New Orleans with unprecedented damage to private property and public facilities.

Growth, Development, and Protection Up to 1900

Spanish explorers came to this setting on several expeditions during the period 1507–1543. They didn't have the extensive maps and records of riverine flooding and hurricanes that were discussed in the preceding section, but they saw enough to deter them from establishing a permanent colony in the area. The large river and vast marshes posed formidable obstacles to development. Another 150 years would pass before La Salle ventured into the area to pursue French interests. After La Salle's death, Canadian Jean Baptiste le Moyne, the Sieur de Bienville, and his brother were recruited to develop French settlements. Contrary to the advice of his engineer, Dumont de La Tour, Bienville chose to establish the new settlement of New Orleans in 1717. It was laid out as a rectangle about one square mile at the site now know as the French Quarter (Harrison 1961). La Tour foresaw the perils of locating near the river, but Bienville was attracted to nearby fertile lands. That fateful decision was made with limited information about frequencies of flooding. Many subsequent decisions, based on better information, compounded it.

Had New Orleans remained as a small outpost, the consequences of river and lake flooding would be of limited significance. It did not remain small, however, as

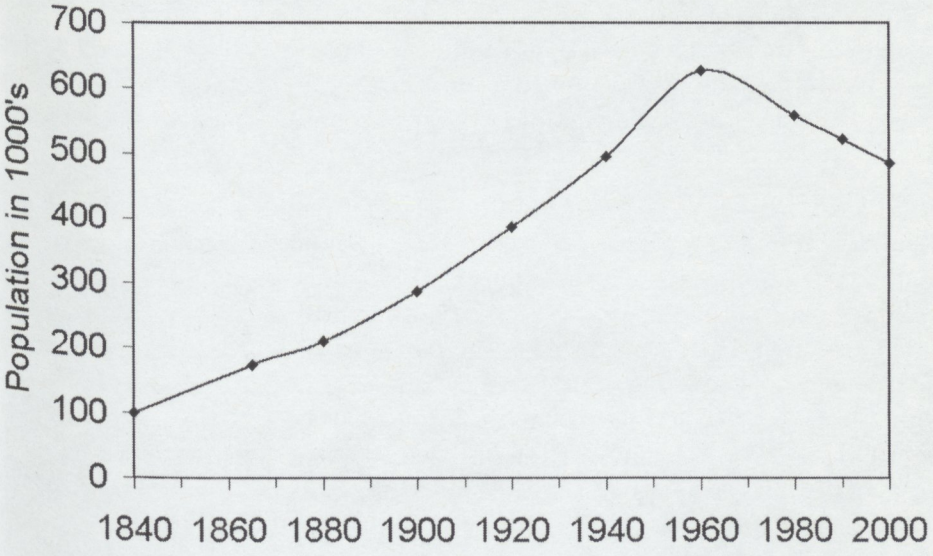


FIGURE 7: Population of New Orleans 1840–2000

illustrated in Figure 7. A milestone was reached in 1840 when the population passed the 100,000 mark. New Orleans grew to 174,000 by the time of the Civil War. A modified version map of New Orleans published by the War Department at the time of the Civil War is shown as Figure 8. It shows urban development still located primarily on higher ground near the river but beginning to spread toward northward toward Lake Pontchartrain. The city continued to grow after the war, reaching 287,000 in 1900. About 31 square miles were developed with residential housing densities greater than 1.0 housing unit per square mile, a value estimated from data in the 1940 Census and areas of tracts for the 1990 Census.

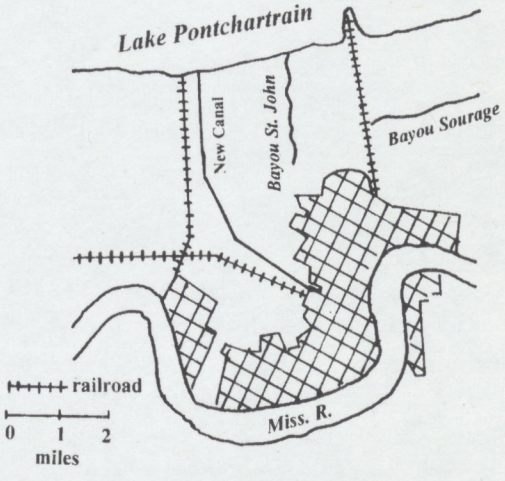


FIGURE 8: Urban Development in New Orleans in 1863 Adapted from Map of Approaches to New Orleans, http://www.rootsweb.com/~usgenweb/maps/louisiana/

That growth could not have occurred without construction of flood control and drainage facilities. La Tour's plan for the city included construction of a series of dikes or levees. He called for a levee height of eighteen feet along the river and six feet to the rear. Those works proved insufficient during flooding over the first six months of 1735. They failed and the city and surrounding plantations were inundated (Harrison 1961).

During the eighteenth and much of the nineteenth century, private land owners were primarily responsible for building levees to protect their own property and making them compatible with adjoining levees. A more effective program of levee building came not by direct state action, but rather through legislation that enabled the formation of levee districts. The Tensas Basin Levee District, established in 1884 and now covering eight parishes, was the first of its kind in Louisiana. The Orleans Levee Board was established in 1890. Its boundaries are coterminous with Orleans Parish. Jefferson Parish is covered by two districts, East Jefferson north of the Mississippi River and West Jefferson south of the river. Pontchartrain Levee District covers those parts of St. Charles, St. John the Baptist, St. James, and Ascension Parishes north of the river. The Lake Borgne Basin District covers St. Bernard Parish.

Levee districts were (and are) empowered to design, build, and maintain levees and other flood control facilities. In more recent times they have also served the primary nonfederal cost-sharing partner for USACE projects. Their activities are funded through property taxes. Authority to levy taxes and the limits on that authority are granted by state legislation specific to each district. Each district is governed by boards, consisting of four to twelve persons, all appointed by the governor.

Management of internal drainage for New Orleans began through a series of public and private initiatives. In 1796, Spanish Governor Carondelet oversaw construction of a canal to carry stormwater from the city to Lake Pontchartrain. It connected the French Quarter to Bayou St. John (Maygarden et al. 1999). The seven-mile New Canal was constructed between 1831 and 1835, connecting the city to the lake. It was later filled and a portion of the right-of-way was used to construct Interstate Highway 10. A canal that is now known as the 17th Street Canal was begun as a drainage ditch created by excavation of material for building a roadbed for the Jefferson Lake Pontchartrain Railroad (see Figure 8) in the early 1850s. The Orleans Canal was constructed to drain the area "back of the city" in 1871, and the London Avenue Canal was first constructed as a small navigation canal in the mid-nineteenth Century. These pieces were made part of a more comprehensive New Orleans Drainage Plan of 1895 formulated in response to a directive of the New Orleans Common Council (Colten 2005). Several major pumping

stations using Benjamin Woods' high-level steam pumps were added in the early 1900s to overcome the very small hydraulic gradient between the city and the lake (Maygarden et al. 1999).

Growth, Development, and Protection 1900–1950

New Orleans' population just about doubled from 1900 to 1950, from 287,000 to 570,000. Changes in spatial patterns of residential development to accommodate that growth can be noted by differences between figures 9 and 10. Of special note is the spread of development toward Lake Pontchartrain into low-lying swamp lands that had been reclaimed by the drainage system built on the 1895 plan.

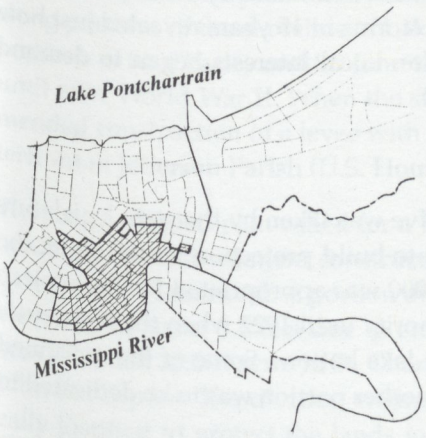


FIGURE 9: New Orleans Census Tracts in 1900 with Housing Density of at Least One Unit Per Acre

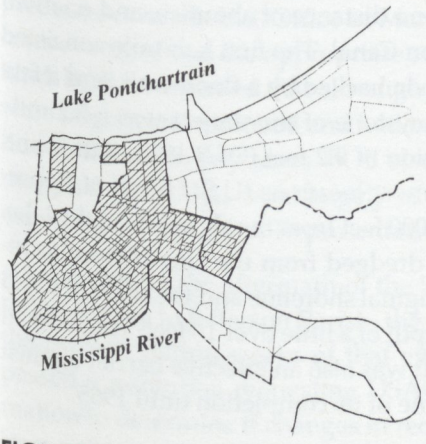


FIGURE 10: New Orleans Census Tracts in 1950 with Housing Density of at Least One Unit Per Acre

Flooding from the Mississippi River had been a primary concern of New Orleans and the Lower Mississippi Valley for much of their past history, but that was changing as development moved away from higher ground near the river. Very good accounts of efforts to control flooding on the Lower Mississippi are numerous. John Barry's book, *Rising Tide* (1997), provides wonderful insights about the great debates over flood control policies for the Mississippi, especially the Humphrey / Abbot vs. Ellet controversy over the period 1850–1865. A particularly engaging part of the book describes the life and times of New Orleans before and after the 1927 flood. Martin Reuss's book, *Designing the Bayous* (1998), gives a detailed account of the flood control plans for the Mississippi River that evolved after 1927 with particular attention to the Mississippi-Atchafalaya system.

In contrast to an abundance of literature about river flooding, relatively little beyond newspaper accounts has

been writtern about hurricane flooding in New Orleans. A treatise on Lake Pontchartrain (Roberts 1946) hardly mentions the topic. Isaac Cline, noted climatologist with the U.S. Weather Bureau (USWB), provides considerable insight about the hurricane of 1915 in his personal memoirs (Cline 1945), but that work does not provide a systematic analysis of hurricane risks in New Orleans.

Local attention to the problem was intensified in the early twentieth century as devastating hurricanes in 1901, 1909, and 1915 spilled flood waters into newly developing areas. The growing population demanded more space for its housing and playgrounds, and the cheapest land available was in nearby swamps and wetlands. Losses of life and property from three storms in 15 years revealed just how vulnerable these newly developed areas were. Local interests began to demand action to reduce the hazard.

The Seawall

One year after the disaster of 1915, an initiative was taken by the state legislature to authorize the Orleans Levee Board (OLB) to build protection works along the lakefront. A rather handsome sum of $1,000,000 was appropriated for the project. No action was taken on the basis of that authority until 1922 when the legislature enabled the board to reclaim portions of the lake bottom. Some of the reclaimed land was to be sold to private interests and another portion was to be dedicated to public parks and parkways.

That undertaking, which became known as the Lakefront Development Project, was initiated in 1926 and full funding was provided by the sale of bonds approved by voters in 1928. Completed in 1932, it extended from the west end of Orleans Parish at what is now the 17th Street Canal for a distance of about six and one-half miles eastward to the Inner Harbor Navigation Canal. The first half mile consisted of a breakwater in front of the new yacht harbor, backed by a flood wall, and a few hundred feet inland by an earthen levee. A keystone of the project was a 5.2 mile stepped seawall, reportedly built to an elevation of 9.2 feet (OLB 1954), but found in the early 1960s to be about 8.2–9.0 feet in most locations (U.S. House of Representatives 1965). The wall was placed 2,500–3,000 feet from the shoreline in the lake and some 33,100,000 cubic yards of soil was dredged from the lake bottom to reclaim about 2,000 acres of land between the original shoreline and the seawall (OLB 1954). Those numbers imply an average fill depth of a little over 10 feet. The seawall served as a very popular recreational facility. It was also an effective barrier against several significant tropical storms from the time of its completion until 1965.

While the seawall was the keystone project in OLB's hurricane protection program, it was one of many levees built to protect the city. As of 1954, its board had responsibility to maintain over 45 miles of levees within the city, about evenly

divided between river front barriers and others, the others including those along drainage canals and the lake front.

Jefferson Parish Levee

The story of federal involvement in the protection of New Orleans from flooding caused by hurricane forces acting on Lake Pontchartrain begin almost a hundred years after the first federal involvement in flooding on the Mississippi River. In August 1941, local residents were successful in getting Congress to include in the Flood Control Act a preliminary examination and survey of flooding conditions along portions of the shoreline of Lake Pontchartrain fronting Jefferson Parish and portions of St. Charles and St. John the Baptist parishes. That study was deferred until after World War II. When the study was completed in 1946, USACE recommended construction of a levee with a crown elevation of eight feet along the waterfront in Jefferson Parish (U.S. House of Representatives 1946).

The recommended plan called for a 10.2 mile levee, located on the landward side of a highway embankment constructed by the state in 1923–1924 to connect New Orleans and Hammond. A portion of that embankment had gradually declined in elevation to about 3.5 feet due to erosion and land subsidence. The initial study area included 35,000 acres in St. Charles Parish, 30,000 in Jefferson, and 7,800 in St. John the Baptist. The division engineer concluded that it would not be economically justified to protect the lands in St. Charles and St. John the Baptist. Of the project lands in Jefferson Parish, 26,000 acres were below the 5-foot contour and 13,000 were below sea level.

When the 1946 report was submitted to the U.S. Bureau of the Budget (BOB, the predecessor of the U.S. Office of Management and Budget) for review, it created a controversy about the appropriate role of federal involvement in projects of that kind. BOB commented that although the lands were adjacent to New Orleans, they were largely undeveloped and had been allowed to revert to the State of Louisiana due to failure to pay taxes. BOB also commented that the project would reclaim marginal lands that were largely of local interest and should be funded at local expense (U.S. House of Representatives 1946).

A year later, in the aftermath of the September 1947 storm that flooded 75 square miles, mostly in Jefferson Parish, the federal government changed its view toward the project. Within weeks of that event, the Senate Committee on Public Works passed a resolution requesting USACE to review its 1946 report and other information to determine if changes in recommendations should be made. That review was completed in early 1949. The Corps recommended that the proposed levee be increased in size to an elevation of 10 feet with a 50-foot crown width and side slopes of 1 foot vertical to 10 feet horizontal (U.S. Senate 1950).

Estimated economic benefits of this project were two-fold, reduction of damage to existing property and enhancement of undeveloped property. Flood damage from the 1947 storm was $3.9 million, and the frequency of that strength of storm was estimated to be once every 13 years on average. By combining those values, the Corps estimated expected annual reduction of flood damage to existing property to be $300,000. Land enhancement benefits for undeveloped property were estimated as the difference in property values with and without the levee. Derivation of that value was based on the following considerations: (a) an estimate that 9,600 acres of land would be made suitable for urban development if the levee was built and (b) the incremental value of those lands would be over $10 million 20 years after construction. Adjustments were made to account for time to development. The result was $273,000 a year in land enhancement benefits. Of the $573,000 in total annual benefits, 52 percent was for flood damage reduction to existing property and 48 percent for land enhancement.

Following completion of the initial Corps' report, considerable discussion ensued about the sharing of costs between federal and local interests. Cost-sharing policy as established after the Flood Control Act of 1936, specified that the federal government would pay 100 percent of construction costs with local interests providing the necessary lands for easements and rights-of-way. BOB raised two issues about what it considered to be a precedent-setting project. First, to what extent should the federal government take responsibility for controlling flooding from lakes? The 1936 Flood Control Act was passed in the wake of massive riverine flooding along the Mississippi River, not storm surges from lakes as in the Jefferson Parish case. Second, to what extent should local interests be required to participate in the cost of projects where land enhancement is the primary benefit? After consultation with the White House, BOB gave its approval with the condition that local interests contribute cash in the amount of 25 percent of project cost. That was considerably above the estimated 5.5 percent that would have been required for provision of land rights. Local interests concurred, and the project was approved.

Growth, Development, and Protection 1950–2000

As shown in Figure 10 and noted previously, most of the land in New Orleans proper between Jefferson Parish to the west and the IHNC to the east had been built out by 1950. Population densities in that part of the city were high, over 9,000 people per square mile. The city needed more land to grow, and the only direction of growth was to the east (OLB 1954). At that time, the land east of the IHNC along the lake front was in swamps, at or below sea level, and protected only by a railroad embankment with an elevation of about eight feet. Urban development in the area without increased flood protection would be a high risk venture. Once again the federal government was convinced to build levees to reduce the risk.

Lake Pontchartrain Hurricane Protection Project

The 1965 Plan. In 1949, as the Jefferson Parish levee project study was being completed, the Senate Committee on Public Works asked the Corps to review its studies of Lake Pontchartrain with an eye to the feasibility of providing improvements in Orleans Parish to reduce flood damage, improve navigation, and reduce beach erosion. An earlier directive from Congress had requested an examination of the need to repair damage to existing protection on the north side of the lake at Mandeville, and in 1957 Congress asked the Corps to revisit the question of extending the Jefferson Parish levee across St. Charles Parish to the Bonnet Carre spillway. All three of those directives were incorporated in a study by USACE completed by the New Orleans District of the Corps in 1963 and, after internal review; it was sent to Congress in March 1964 and printed as House Document 231 in July 1965 (U.S. House of Representatives 1965). In September 1965, just 20 months after the plan was sent to Congress, Hurricane Betsy, the fourth most destructive storm in U.S. history, caused the worst flooding New Orleans had seen in decades. The plan was approved the following month as part of the Flood Control Act of 1965 (Public Law 89-298). Initial funding for preconstruction engineering and design was included in the FY1966 budget, and initial construction funding was part of the FY1967 budget.

To solve hurricane-related flooding, the Corps considered two options for enhancing protection of portions of St. Charles, Jefferson, Orleans, and St. Bernard Parishes. One was referred to as the High Level Plan (HLP), the other the Barrier-Low

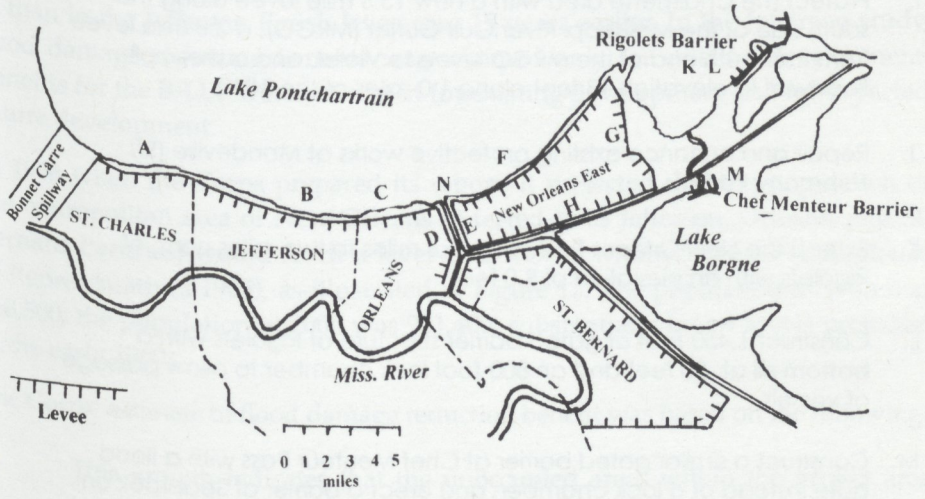


FIGURE 11: Components of the Barrier Low Level Plan of 1965

TABLE 2: Components of Barrier Low Level Hurricane Protection Plan

A. Build a new levee along the St. Charles Parish lakefront

B. Reinforce the existing Jefferson Parish levee, but no change in elevation

C. Raise the elevation of the New Orleans lakefront levee to 11.5 feet

D. Build a 5.8 mile sheet pile floodwall to elevation 13 feet on top of the levee on the west side of the IHNC

E. Build a 3.1 mile sheet pile floodwall to elevation 13 feet on top of the levee on the east side of the IHNC

F. Build a 10.8 mile earthen levee from the IHNC eastward along the lakefront to South Point, the first 4.5 miles at elevation 11 feet (the Citrus levee), and the next 6.3 miles at 10 feet elevation (the New Orleans East levee)

G. Keep the existing levee from South Point to U.S. Highway 90 and enlarge the existing levee from U.S. 90 to GIWW and along GIWW for a distance of 9.3 miles at elevation 16 feet

H. Enlarge 7.4 miles of the Citrus back levee along the Gulf Intracoastal Waterway to an elevation of 13 feet west and 16 feet east of Paris Road

I. Protect the Chalmette area with a new 13.5 mile levee along the south side of the Mississippi River Gulf Outlet (MRGO), a 3.8 mile levee from the south end of the MRGO levee to Violet, and a sheet pile floodwall to elevation 13 feet along 1.0 miles of the IHNC

J. Repair and enhance existing protective works at Mandeville (St. Tammany Parish)

K. Extend the New Orleans East levee 5.6 miles to two miles north of Rigolets with an elevation of 9.0 feet

L. Construct 1,450 foot of gated barrier structure at Rigolets with a bottom sill at -20 feet and an 800-foot lock chamber to allow passage of vessels

M. Construct a similar gated barrier at Chef Menteur Pass with a flood gate instead of a lock chamber; and erect a barrier at Seabrook on the lake end of the IHNC

Source: U.S. House of Representatives 1965.

Level Plan (B-LLP). The HLP envisioned raising, strengthening, and extending existing protective structures to meet more stringent hurricane standards. It was estimated it would cost about $100 million and would take much longer to build than the B-LLP, which had a first cost of about $64 million. The HLP was quickly dropped, and no details of it were included in the 1965 report. The B-LLP, shown in Figure 11, included the components listed in Table 2.

Barriers at Rigolets and Chef Menteur were intended to prevent or dampen storm surges from entering Lake Pontchartrain and the Gulf Intracoastal Waterway. The Seabrook complex was intended to prevent flood tides from entering Lake Pontchartrain through the MRGO and IHNC, to control velocities in the IHNC, and to avoid salt water intrusion into the lake from MRGO.

Levee heights in both the HLP and the B-LLP plans were designed to withstand storm surge and wave run-up from a hurricane with particular parameters, including central pressure deficit, radius, and maximum wind speed. It was referred to as the Standard Project Hurricane (SPH), defined as "one that may be expected from the most severe combination of meteorological conditions that are reasonably characteristics of the region." The Corps relied on a study by the U.S. Weather Bureau to establish parameters of that storm. Maximum wind speed for the SPH was 100 miles per hour. Each section of the levee system was designed with the SPH on a path that would produce maximum wind speed perpendicular to that section.

As in the case of the Jefferson Parish levee project in 1950, benefits of the proposed B-LLP included both flood damage reduction and land enhancement benefits. In this study, flood damage reduction benefits were treated somewhat differently than in the Jefferson Parish levee case 15 years earlier. In the Jefferson study, flood damage reduction benefits were claimed only for existing development. Benefits for the B-LLP were calculated for existing development and for expected future development.

In 1963 when the Corps prepared its report, it projected that the population of the metropolitan area of New Orleans (referred to as Jefferson, Orleans, and St. Bernard Parishes) would reach a level of 2,000,000 within 50 years (U.S. House of Representatives 1965), as illustrated in Figure 12. The population in 1960 was 868,500; the population in 2000 was 981,400, substantially below levels projected in the early 1960s.

The Corps' estimate of flood damage reduction benefit was based on the following:

> This growth indicates that the unoccupied areas within the project area on the south shore of Lake Pontchartrain within Jefferson, Orleans, and St. Bernard Parishes would be completely developed within 50 years . . .

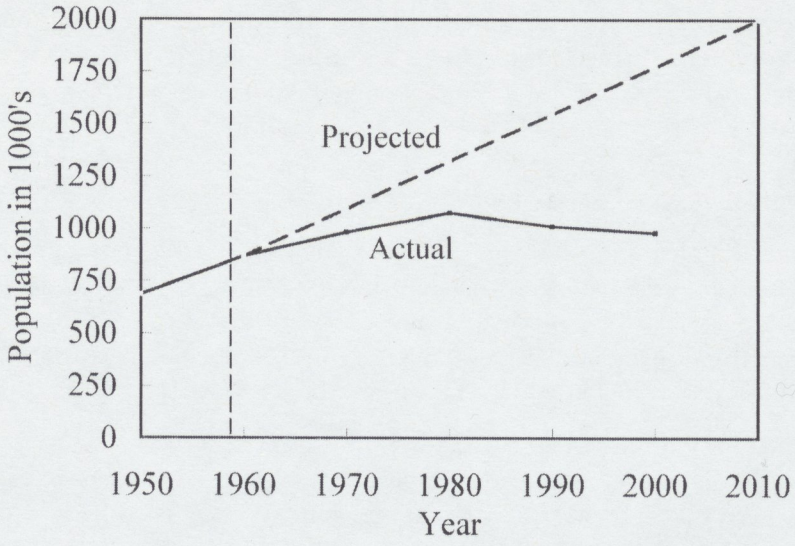


FIGURE 12: Population of Jefferson, Orleans, and St. Bernard Parishes: Actual and As Projected by the Corps in Early 1960s

> This growth is expected to occur without further protection from hurricane flooding. . . . It was assumed that future improvements constructed in those areas would be similar to those in adjoining developed areas.

About 1,100 square miles in the area were considered to be subject to flooding by the SPH if no additional protection was provided. A little over one-third of that was in exposed areas along the shores of Lake Borgne; 12 percent in leveed areas in Jefferson, Orleans, and St. Bernard Parishes; and 48 percent in wetlands. Forty-six square miles of land in St. Charles Parish was subject to flooding.

Estimation of expected annual flood damages were made by: (1) estimating property damage that would be incurred if the SPH or a larger storm occurred, and (2) assigning a probability to the occurrence of such a storm. The SPH was assigned an average return interval of once in 200 years or an annual probability of occurrence of 0.005. Benefits assigned to the LPHPP were determined by the difference in expected annual damages without the project and with the project. Those benefits were reported for two areas: first, for areas subject to flooding from Lake Pontchartrain in St. Charles, Jefferson, and Orleans Parishes, and, second, the Chalmette area. Those estimates are given in Table 3.

At that time, the Corps estimated that 101,000 acres of land in St. Charles, Jefferson, and Orleans Parishes would be inundated by a hurricane with attributes of the SPH. Only about 30 percent of inundated land in those three parishes was devel-

TABLE 3: Estimated Average Annual Flood Damage Reduction Benefits, 1965 ($US millions)

	Along Lake Pontchartrain	Chalmette Area
1. Damage without project, present conditions	$ 9.504	1.212
2. Damage with project, present conditions	0.036	0.007
3. Damage prevented to existing property[a]	9.468	1.205
4. Damage prevented with future development	46.903	4.773
5. Damage prevented to future property[b]	37.435	3.568

Source: U.S. House of Representatives 1965.

Notes: a. Damage prevented to existing property = damage without project (line 1) less damage with project (line 2). b. Damage prevented to future property = damage prevented with future property (line 4) less damage prevented to existing property (line 3).

oped at the time. Benefits summarized in Table 3 show that eighty percent of the flood damage reduction benefits for areas along the Lake Pontchartrain lakefront were based on projected future development. Seventy-five percent of the benefits in the Chalmette area were based on future development.

Details of projected growth areas are not given in the report. It was reported that 22 percent of the annual damages from future development were in Jefferson Parish, 46 percent in New Orleans East west of Paris Road, and 31 percent east of Paris Road.

Land enhancement benefits were added to flood damage reduction benefits. About 30,000 acres of St. Charles Parish would have been drained, transforming them from wetlands into areas suitable for urban development. Another 18,800 acres of wetlands in Orleans and St. Bernard Parishes were included within levees to protect the Chalmette area. Land enhancement benefits associated with transforming these areas into lands suitable for development were included in estimates of the project's benefits.

1984 Revaluation. A major change to the project occurred in 1984. Following passage of the Environmental Policy Act of 1969, the Corps was obligated to prepare an Environmental Impact Statement (EIS) for the project. The EIS was completed in August 1974 and filed with the Council on Environmental Quality in January 1975. It was immediately challenged by an environmental interest group, and a

federal district judge ruled the EIS to be inadequate. In December 1977, he enjoined the Corps to stop construction of the barrier complexes and most of the levees. Since the chief concerns of the plaintiffs were about the barrier complexes and the St. Charles Parish levee, the judge relaxed the injunction in early 1978, allowing construction to proceed on all elements of the plan except those features.

While the Corps continued to defend the B-LLP (Rush 1978), it was already doubtful that the barrier complexes would ever be built. In a report to Congress on cost, schedule, and performance of the project in August 1976, the Comptroller General noted:

> The threat of litigation by environmental groups affect the Lake Pontchartrain project in two ways. First, the litigation has delayed timely completion of the project. Second, there is the possibility that the control structures of Rigolets and Chef Menteur will not be built, which will allow hurricane-induced surges to enter Lake Pontchartrain and spill over the levees as currently designed (U.S. General Accounting Office 1976).

Environmental concerns did alter the Corps plan in very substantial ways. In a 1984 revaluation of the project, the Corps reverted to the High Level Plan (USACE 1984). It was prepared in response to the court's ruling that when a hurricane plan that is "properly presented" in "proper compliance" with the law regarding environmental impact statements, the injunction would be dissolved and the plan would be allowed to proceed.

Details of the HLP had not been worked out in the 1965 report because it had been rejected as too costly. A significant portion of the levee system under the B-LLP had either been completed or was under construction, so increasing the level of protection in 1984 called for building of floodwalls atop existing levees along several miles of the protective works. The HLP also dropped the barriers at Rigolets and Chef Menteur, relocated the St. Charles Levee, and made other lesser changes.

The St. Charles Levee was relocated from the lakefront alignment proposed in 1965 to parallel U.S. Highway 61, several miles away from the lakefront. That decision protected a large area of wetlands and preserved two bayous that were designated natural and scenic streams by the State of Louisiana. Changes to levees are summarized in Table 4 below, showing the crown elevations as they existed in 1965, the elevations as called for in the B-LLP, elevations given in the 1984 Reevaluation Report, and revisions made when detailed designs were prepared.

Portions of the system were not at those elevations when Katrina struck the city. There was some confusion between the elevation datum to which the system was designed and the datum to which it was constructed. Elevations of levees

TABLE 4: Elevations of Levees and Floodwalls as of 1963, in Barrier Low Level Plan and High Level Plan

	Crown Elevations for Levees/Floodwalls in feet			
Levee	1963	B-LLP	1984 Reevaluation High Level	Design Memo* High Level
St. Charles	none	10	13.5-14	13.5-14
Jefferson	10	10	14 (p133)	16.5-22.5
Orleans	8.2-9	11.5	14.5 (p133)	13.5-20.5
IHNC	9.6	13		14
Citrus Lakefront	8.3	11	13.5-15 (p134)	14.5
New Orleans East Lakefront	8.3	10	16.5 (p134)	18-18.5
South Point to GIWW	11.6	16	13.5-15 (p134)	13.5-17.5
Citrus Back				
West of Paris Rd.	9.6	13	14 (p134)	14
East of Paris Rd.	9.6	16	14 (p134)	18
New Orleans East Back	9.6	16	17.5 (p134)	19.0-23.0
Chalmette Area	1.5-6	17.5	17.5	17.5

*As given in USACE DM 1966, 1984a, 1984b, 1985, 1987a, 1987b, and 1989.

were also reduced because of land subsidence. The Interagency Evaluation Task Force (IPET) (USACE 2006) found spatial and temporal variations of 0.2 to 3 between the geodetic datum on which facilities were constructed and mean sea level datum on which facilities were designed and authorized. The result was that structures along the outfall canals were built 1 to 2 feet below the intended elevation. In the case of the IHNC, IPET found that structures were more than 2 feet below design elevations, primarily due to subsidence over the 35 years since they were constructed.

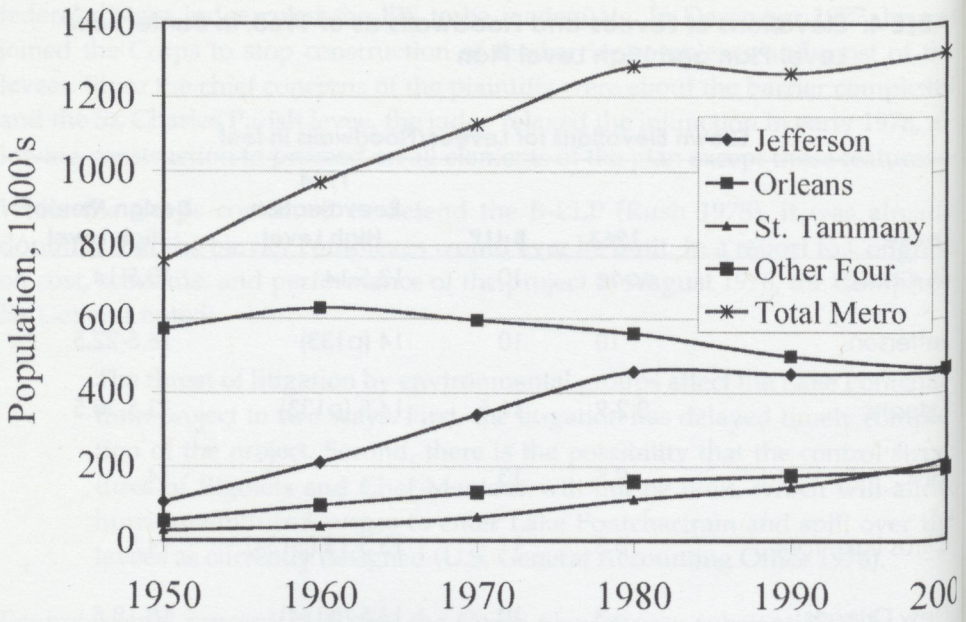


FIGURE 13: Population of New Orleans and the Metropolitan Area 1950–2000

Urban Development

Authorization and construction of the LPHPP made urban development possible in the newly protected areas. New development was pushed in part by growth in the metropolitan area and in part by flight from the central city. New Orleans actually lost about 165,000 people from 1960 to 2000, while the population of the seven-parish metropolitan area continued to grow. As shown in Figure 13, the metro population reached 1.32 million in 2000 with Jefferson and St. Tammany Parishes experiencing the largest gains.

There were substantial shifts in spatial patterns of housing even within Orleans Parish as it was losing population. As shown in Figure 14, substantial new development occurred in New Orleans East (NOE) in a part of Census Tract 17. Prior to 1950, only 1.6 percent of all housing units in Orleans Parish were located in that area. Change was especially pronounced after 1960 when 29,300 new housing units were built in NOE while only 4,500 new units were added in the rest of the parish. Most of the NOE growth occurred west of Paris Road. Many older units in the parish were being abandoned as 34,000 new housing units were added during a period when there was a loss of 165,000 people.

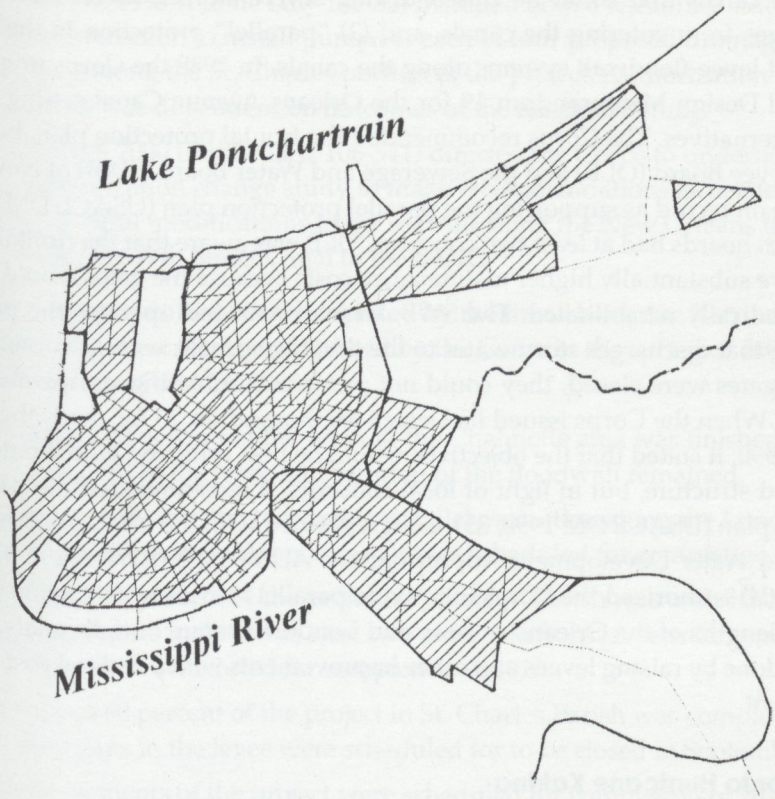


FIGURE 14: New Orleans Census Tracts in 2000 with Housing Density of at Least One Unit Per Acre

The ethnic makeup of New Orleans also changed dramatically during this period. In 1960 whites made up 63 percent of Orleans Parish. By 2000, that percentage had dropped to 28 percent. Whites decreased by 267,000, about two-thirds of their 1960 level. That loss was partially offset by an increase of 98,000 nonwhites over the same period.

Protecting the Drainage Canals

As described by Carter (2005), the issue of providing additional protection for the drainage canal remained a matter of considerable debate after the High Level Plan was adopted. In 1965 the Corps judged that protection provided along the 17th Street, Orleans Avenue, and London Avenue outfall canals was adequate. By the late 1980s the Corps was less satisfied and designs were initiated to enhance the level of protection. Two alternatives were formulated and evaluated, namely: (1) "frontal" protection consisting of butterfly floodgates at the Lake Pontchartrain

end of the canals that could be closed during severe storms, thereby blocking storm surges from entering the canals, and (2) "parallel" protection in the form of elevated levee-floodwall systems along the canals. In 1988 the Corps prepared its General Design Memorandum 19 for the Orleans Avenue Canal setting forth the two alternatives. The Corps recommended the frontal protection plan, but the Orleans Levee Board (OLB) and the Sewerage and Water Board (SWB) of New Orleans were on record as supporting the parallel protection plan (USACE DM 1988, 2). The local boards had at least two concerns. OLB was aware that the frontal plan would have substantially higher maintenance costs because the gates would have to be periodically rehabilitated. The SWB, which owns and operates the pumping system that discharges stormwater to the drainage canals, was concerned that when the gates were closed, they could not pump accumulating stormwater out of the city. When the Corps issued its Design Memorandum 20 for the 17th Street Canal in 1990, it stated that the objectives would be best achieved with a butterfly valve gated structure, but in light of local concerns, it recommended the parallel protection plan (USACE DM 1990, 35). Congress sided with the local agencies. The Energy and Water Development Appropriations Act of 1992 (EWDAA92, Public Law 102-104) authorized the Corps to provide parallel hurricane protection along the entire lengths of the Orleans Avenue and London Avenue outfall canals. That was to be done by raising levees and other improvements with a Federal cost share of 70 percent.

Status Prior to Hurricane Katrina

In addition to EWDAA92, the Lake Pontchartrain Hurricane Protection Plan has been the subject of more than a dozen acts of Congress since 1984, either in annual or biennial Water Resources Development Acts (WRDAs) or appropriations bills. Some of the more significant actions were:

- WRDA 1986 (Public Law 99-662) modified the original authorization to include a flood wall and sluice gates to insure that the level of protection is maintained after pumping facilities were installed by local authorities.
- WRDA 1990 and WRDA 1992 (Public Laws 101-640 and 102-580) directed the Corps to study the benefits that accrue to nonfederal sponsors from the project to determine if project sponsors had gotten the benefits that had been estimated when the project was authorized. Sponsors were seeking to have the federal government pick up a larger share of the cost.
- WRDA 1992 also authorized the Corps to "construct measures to intercept and convey drainage from the landside slopes of project levees in Jefferson Parish . . . directly to the existing drainage system."

- WRDA 1999 (Public Law 106-53) included both a feasibility study of and authorization to install pumps at each of four proposed drainage structures along the St. Charles portion of the project. Authorization to construct was dependent on outcomes of the feasibility study.
- WRDA 2000 (Public Law 106-541) directed the Corps to undertake a post-authorization change study to make recommendations as needed to make structural modifications to the seawall along the New Orleans lakefront from the 17th Street Canal to the IHNC.

Much of the project had been completed by the time Hurricane Katrina hit in August 2005. A project fact sheet updated by the Corps in the spring of 2005 gave the status as follows (USACE 2005a):

- About 90 percent of the work in the Chalmette area was finished. An additional lift to the levee and capping of the floodwall remained.
- Major construction to provide parallel protection along the London Avenue and Orleans Avenue canals was scheduled for completion in 2010.
- About 30 percent of the project in Jefferson Parish was unfinished; remaining projects included at least two more lakefront levee enlargements. They were scheduled for completion in 2010.
- About 60 percent of the project in St. Charles Parish was complete. The last two gaps in the levee were scheduled for to be closed in September 2005.
- All elements of the project were scheduled for completion in 2015.

The Corps reported at that time that there were two principal effects of budget shortfalls. One was that two major pump stations, susceptible to damage by hurricane storm surges, were in need of frontal protection. Second, settlement of several levees had reduced the level of protection below their design levels. Additional funds were needed to raise their elevations.

The Subcommittee on Energy and Water Development, House Committee on Appropriations, was given a briefing on the project in September 2005 by Anu Mittal, director of Natural Resource and Environment of the Government Accountability Office. He reported that the Corps had completed a reconnaissance study in 2002 (a preliminary feasibility study) on the question of whether the hurricane protection system should be upgraded to protect from a Category 4 or 5 storm. In March 2005 the Corps estimated that a full feasibility study would take five years and $8 million to complete. Those funds were appropriated in November 2005 after Katrina (U.S. House 2005).

Discussion

As this paper was being written, a consensus was emerging as to why protective measures failed during Hurricane Katrina. In-depth analyses of causes of failure have been underway since October 2005 by an Interagency Performance Evaluation Taskforce appointed by the chief of engineers to perform an engineering evaluation of the levees system during Katrina. An independent external review panel of experts appointed by the American Society of Civil Engineers (ASCE) was providing advice to IPET. A draft final report was issued June 1, 2006 (USACE 2006). The secretary of defense also directed the assistant secretary for civil works to convene an independent panel appointed by the National Academy of Sciences to "perform a high-level review and issue findings based on the IPET, ASCE panel, and other data" (USACE 2005b).

While all of those investigations are not yet complete, the initial reports show that several miles of the levees were overtopped and breached, particularly those along MRGO, the Gulf-Intracoastal Waterway (GIWW), and the IHNC. There is little evidence to suggest that floodwalls along the drainage canals were overtopped. (Nicholson 2005; USACE 2005b). The failure of the floodwall on the 17th Street Canal was due to weak soils that provided inadequate resistance to hydrostatic pressures of elevated water levels (USACE 2006).

It is important in closing to note that federal policy has changed substantially since the LPHPP was authorized in July 1965. Some of those changes have had significant effects on the project. Among them are:

- Passage of the Water Resources Planning Act in 1965
- Passage of the National Environmental Policy Act in 1969
- Passage of the Clean Water Act in 1972
- Changes in policy governing projects with large land development opportunities
- Emergence of concepts of adaptive management and environmental restoration.

Just four months earlier Congress passed the landmark Water Resources Planning Act (Public Law 89-404) that established the U.S. Water Resources Council (USWRC) and directed it to formulate a new set of principles and standards for planning water and related land resources. That document, first published in draft form in 1969, established a new multiple objective planning model that placed equal weight on the objectives of national economic development (including flood damage reduction) and environmental quality.

Even the draft version of the principles and standards was influenced by passage of the National Environmental Policy Act (NEPA) in 1969 with its requirement for environmental impact statements and public involvement. As noted earlier, that requirement had an important affect on the LPHPP in 1984.

Seven years after the LPHPP was authorized, the Federal Water Pollution Control Act Amendments (Public Law 92-500), was passed. Section 404 of that Act (now referred to as the Clean Water Act) was later interpreted by the courts to require permits for development affecting wetlands. Portions of the LPHPP were affected when a major realignment was made to levees in St. Charles Parish.

Another change in federal policy affects projects that are primarily land development opportunities. Projects of that kind are no longer allowed as Corps of Engineers flood controlled projects (USACE 2000).

It may be idle speculation to consider how the project would fare if it was being proposed in 2005. Lessons learned from the past 60–80 years of public investments to protect the area should be important guides to the rebuilding of New Orleans and surrounding areas. We now know that

- the risk of devastating tropical storms and hurricanes has been consistently underestimated;
- criteria for justifying protective measures has followed traditional principles and standards derived primarily from riverine flooding with inadequate consideration to the threat of loss of life, massive destruction to an entire city, and displacement of hundreds of thousands of people to distant communities for an extended period of time;
- evaluation of risk gave insufficient attention to an array of factors that could cause failures of levees and floodwalls, factors other than overtopping due to storm surge; and
- facilities were built to enable transformation of huge areas of wetlands to urban development well in advance of need based on highly speculative projections of land use that greatly exceeded the levels of development that actually occurred.

Perhaps the most significant observation is that the risk of catastrophic damage to New Orleans from effects of hurricanes has been consistently underestimated, underappreciated, or simply ignored. With Katrina added to the record, 50 hurricanes over the past 155 years have had significant effects on Louisiana. One Category 5 storm barely missed New Orleans; there have been five Category 4 storms, two of which left tracks through Orleans Parish. Several Category 3 storms resulted in major damage to the city. That record clearly demonstrates that the probability of

a catastrophic storm is not negligible. In 1965 the expected return interval for the Standard Project Hurricane was 200 years. Storms that have occurred since then have clearly altered estimates of return frequencies, but even with an average return interval of 200 years (a probability of 0.005 that such a storm will occur each year), the probability of an occurrence of at least one storm of that magnitude in 25 years is 0.12, a probability of 0.22 in 50 years, and 0.39 in 100 years. With a 300-year storm, the probabilities of at least one hit in 25, 50, and 100 years are 0.08, 0.15, and 0.28, respectively. Those are large risks when an entire major city is in danger of devastation.

Research by the Corps of Engineers summarized in Table 1 shows that protective measures have repeatedly failed to eliminate destructive floods. When the Lake Pontchartrain Hurricane Protection Project was formulated in 1965, the U.S. Weather Bureau and the Corps of Engineers adopted a Probable Maximum Hurricane with wind speeds of 115 miles per hour. Four years later Hurricane Camille exceeded those speeds in the vicinity of New Orleans. Katrina was reported by the National Hurricane Center to have maximum sustained winds in excess of 125 miles an hour when it passed through New Orleans.

When formulating and evaluating protection measures for New Orleans and vicinity, the economic justification for LPHPP projects treated flooding in New Orleans the same as riverine flooding that occurs throughout the country. Floods that destroy homes and livelihoods anywhere have disastrous effects on individuals and communities, but New Orleans is different. There are few places in the country where the consequences of failures in flood protection measures pose such a widespread threat to an entire city and surrounding metropolitan area of nearly a million people, to their homes, neighborhoods, schools, hospitals, churches, places of employment, and cultural resources. Hundreds of lives are at risk. Economic effects of a major catastrophe would and did stretch to agricultural and other interests throughout the Midwest who depended on the port of New Orleans to ship their products. Standard methods were used to estimate the benefits of flood damage reduction resulting from hurricane protection projects. Estimated damages to inundated properties were multiplied by frequency of floods to derive expected annual property damage with and without proposed projects. There is no mention in project documents of the loss of life, massive displacement of people for an extended period of time, or other economic and cultural losses.

New Orleans is a rare case, but it is not the only case of its kind in the United States. One other example is the city and county of Sacramento, California. Some 400,000 people and over $40 billion in property value are at risk of flooding, including the central business district and state capitol (National Research Council 1999). Recently, the Corps of Engineers confirmed an analysis by the Sacramento Area

Flood Control Agency that concluded the Natomas Basin levees in Sacramento may be subject to unacceptable risk of failure (McCarthy and Lamb 2006).

Even with the use of standard methods for justifying projects, the Corps had to make highly questionable assumptions to satisfy the benefit-cost criterion for portions of the project. Population over the next 50 years followed a straight line extrapolation of the 1950–1960 rate of growth. Inadequate consideration was given to characteristics of land resources to accommodate that growth.

Actual population was less than half the projected level. The Corps could not have been expected to foresee in 1960 effects of social change that resulted in a net loss of nearly 150,000 people from Orleans Parish beginning shortly after that projection was made. However, the assumption that projected growth would occur with or without hurricane protection measures is highly questionable. Would 36,000 new housing units have been built in the New Orleans East without protective levees on the lake front and on the back? Would 30,000 new residents have moved into St. Bernard Parish without improvements to the levees? The answer to each of those questions is not an unequivocal yes.

Project evaluation did not include any assessment of the risk that structural failures could occur to levees and flood walls because of factors other than overtopping by storm surge. There was at least an implicit assumption in project reports in 1950 and 1965 that so long as peak storm surges are below elevations of protective structures, the study area would be protected. There is anecdotal evidence that several other factors may have contributed to the failures. More definitive assessments of those factors are in progress.

Seventy-nine percent of economic benefits of the St. Charles, Jefferson, Orleans Parishes' portion of the LPHPP were based on future land development to occur over the next 50 years. It was assumed that all available areas in Jefferson and Orleans Parishes would be developed. The area east of the IHNC and north of the Intracoastal Waterway included within the LPHPP levees is approximately 83 square miles. Actual development over the past 40 years has covered only about 22 square miles, about one-quarter of the protected area. The Chalmette area levees enclose about 134 square miles, about 50 of which are now in urban development. These two areas together encompass almost 220 square miles, and only one-third of it is urban development. This outcome once again underscores the huge amount of uncertainty associated with making land use projections over extended periods of time. It also suggests in hindsight that a more prudent approach would have been that of adaptive management. Levees to protect New Orleans East and Chalmette areas could have been expanded incrementally as needed to protect urban development as it actually occurred instead of building them 50 years in advance

of development. Such an approach would also have protected a larger share of the wetlands in those areas. The Corps of Engineers could benefit from that lesson as it formulates and evaluates the feasibility of providing increased levels of protection for the New Orleans metropolitan area. There remains considerable uncertainty as to what portions of the city will be repopulated in the aftermath of Katrina.

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Part 3:

Culture of Disaster and Social Vulnerability

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Beyond Disaster: Locating Katrina within an Inequality Context

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Abstract

This research draws upon structuration theory and social capital theory to demonstrate how evacuee choices are constrained by social structure and a lack of extended social networks, resulting from differential evacuee experiences and outcomes. Utilizing data collected from Hurricane Katrina evacuees, this research attempts to locate disaster within a social inequality context. Findings have potential implications for recontextualizing the disaster research program, providing more theoretical application to the disaster research program, and generating more triangulated research, which may improve our overall understanding of disasters and how inequality is exacerbated over time.

Keywords: social stratification, inequality, social networks, disaster, structuration, triangulation, Katrina

In the middle and late 1960s, a series of civil disturbances in Los Angeles, Newark, and Detroit drew significant attention to the deepening inequality within America's urban centers (Anderson 1973; Forrest 1973; Gordon 1976; Kreps 1973; Quarantelli and Dynes 1970; Sears 1994; Weisbrot 1991). However, as the frequency of urban disturbances declined, so too did public attention to their structural causes. Although the social problems of underperforming schools, racial segregation, high unemployment, widespread poverty, and crime persisted, for

most Americans, who do not live in large urban areas, these problems remained largely "out of sight, out of mind" (Judd 1988, 302).

Recently, in the aftermath of Hurricane Katrina the persistent inequities of urban life in New Orleans were laid bare on television for millions of people in the United States, as well as the world. As the levees were breached and the floodwaters rose in New Orleans, television images of thousands of citizens trapped outside the Louisiana Superdome and New Orleans Convention Center, without adequate food and water, caused many viewers to "rediscover" the urban underclass. Although the urban underclass is by no means a new phenomenon to social scientists, it has long been an understudied phenomenon, particularly within the disaster context (Barnshaw 2005; Marks 1991; Tierney, Lindell, and Perry 2001; Wilson 1987). This chapter seeks to locate the experiences of Hurricane Katrina evacuees within the larger context of social stratification and demonstrate how their "choice" to evacuate was constrained largely by social forces of structured inequality and a lack of social resources (social capital) to evacuate elsewhere prior to the storm. However, first, a review of the literature is necessary.

Literature Review

As mentioned, issues of inequality and stratification have long been understudied within the disaster context. This is largely because, beginning with the first studies conducted by the National Research Council and the National Opinion Research Center in the early 1950s, inequality and stratification were not seen as particularly salient topics for disaster research (Quarantelli 2005). For many of the pioneers in disaster research, a disaster was seen as an event creating a disruption in the social structure (Endleman 1952; Fritz 1961). This perception was heavily influenced by the need to understand civil defense and the need to prepare for nuclear war; disaster was seen as a quasi-experimental context for understanding human behavior under extreme socially disrupting events (Barton 1969; Dynes 1993; Hewitt 1983; Kreps 1984; Mileti 1999; Quarantelli 1982a, 1982b, 1985, 1987, and 1995). This approach was informed by the functionalist perspective, which sensitized disaster researchers to focus on interactions between individuals and social structures in a variety of contexts ranging from community organization to response to disruption and resumption of services (Dynes 1969; Tierney et al. 2001). Thus, for the majority of the past half century disaster research has understood the context of disaster as an aberrant event that creates a significant disruption for agents, organizations, and social structures exceeding the capabilities of the social system for a period, followed by the resumption of services and a return to normalcy or routine (Stallings 1998).

However, this is not to say that stratification and inequality have not been examined within the disaster context. Most of the disaster research on inequality and stratification has focused on issues of vulnerability. Vulnerability is the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist, and recover from the impact of an extreme event or process (Wisner et al. 2004 [1994], 11). In perhaps the first identification of vulnerability by stratification, Bates and colleagues (1963) found that working class individuals in Hurricane Audrey suffered disproportionately greater loss than those of the middle or upper class in disasters. These findings were supported in subsequent disasters and extended to include stratification along racial, ethnic, political power, and gender lines (Cochrane 1975; Killian, Peacock, and Bates 1983; Kreig 1995, 1998; Rosen 1994). Although most of the disaster inequality has focused on vulnerability, some studies have focused on how disaster exacerbates pre-existing inequality (Bolin and Bolton 1986; Geipel 1982; Haas, Kates, and Bowden 1977; Low 1988; Oliver-Smith 1986, 1989; Peacock and Bates 1982). Specifically, in the United States, working class African Americans and Latinos with little political power may be most vulnerable in a disaster context. Although issues of vulnerability have been raised within the disaster context, it has only been within the past decade that they have been treated more systematically.

Some of the more recent systematic treatments of inequality have attempted to understand stratification within an ecosociopolitical context. Wisner and colleagues (2004 [1994]) have argued that disaster is a product of social, political, and economic environment, distinct from the natural environment, because of the way it structures the lives of different groups of people. Similarly, Peacock, Morrow, and Gladwin (1997) addressed issues of inequality, particularly gendered inequality, within an ecological field framework. More recently, Klinenberg (2002) illustrated how the social autopsy of Chicago demonstrates how heat wave victims were stratified along race, class, gender, and age lines, with a disproportionate number of victims being elderly, working class African Americans.

Despite the recent emergence of disaster-stratification scholarship, much of this research only highlights issues of stratification *within* the disaster context, rather than focusing on disaster *within* an inequality context. Thus, previous research has only been able to demonstrate how stratification has changed as a result of the disaster. By looking at disaster within an inequality context, this research offers the potential to take into account pre-existing stratification and inequality that is not bound by the disaster. Most previous research has likely not focused on pre-existing stratification and inequality because disaster was considered to be a disruptive event and it was assumed that resumption of normalcy meant a return to the status quo. Providing characteristics present in disaster does not necessarily mean one has provided the context in which they occur. Few studies have undertaken this

line successfully (Bolin and Bolton 1986; Geipel 1982; Haas, Kates, and Bowden 1977; Low 1988; Oliver-Smith 1986, 1989; Peacock and Bates 1982). Though more recent research has attempted to remedy this, few studies have attempted to link issues of stratification with social networks, which are often a vital component for contextualizing and understanding inequality (Peacock et al. 1997; Klinenburg 2002; Pelling 2003). Similarly, few studies have attempted to link disaster with a theoretical perspective other than middle-range functional theories (Stallings 1998). However, some notable exceptions include theoretical work utilizing social constructionism (Kreps and Drabek 1996; Stallings 1991, 1995), postmodernism (Luhmann 1993), conflict-based political economy (Bolin and Stanford 1998; Hewitt 1983; Stallings 1988; Tierney 1989), political ecology (Bates and Pelanda 1994; Peacock et al. 1997), critical theory (Dombrowsky 1987), and role enactment (Kreps and Bosworth 1994; Webb 1998).

This research focuses on reconceptualizing disaster within an inequality framework, incorporating the larger sociological literature of structuration and social capital theories so as to understand the processes that link individual agents with structures and social networks of inequality, demonstrating how disaster serves as a catalyst for the exacerbation of pre-existing inequality within the social system. In order to understand how these social processes operate, a brief understanding of structuration theory and social capital theory is necessary.

Theory

Structuration theory, according to Giddens (1984, 326), is a series of sensitizing concepts designed to provide a synthesis between the traditional duality of social structure, generally considered a macro-level phenomenon, and individual agency, generally considered a micro-level phenomenon. Central to structuration is the notion that social structure is used by active agents and, in doing so, agents transform or reproduce social structure (Giddens 1984; Tucker 1998; Turner 2003). In contrast to most previous research on structure and agency, structuration is less a location and more a process. The process of structuration is joint interaction between structures and the agents who create them, thereby producing human interaction and organization within the social system (Turner 2003).

Although this research highlights the theoretical application of structuration as a means for understanding stratification within the disaster context, it is by no means the first in disaster studies (Palm 1990; Santos-Hernández 2006; Wachtendorf 2004), nor a definitive account of structuration (Giddens 1984, 1990; Cohen 1989; Clark, Modgill, and Modgill 1990; Cassell 1993; Turner 2003; Tucker 1998). However, structuration offers several benefits over previous theoretical research (Bourdieu 1977, 1986; Bourdieu and Passeron 1977; Bourdieu and Wacquant 1992;

Elias 1978, 1991; Gills and Frank 2002; Wallerstein 1979, 1980). Prior theoretical analysis (Bolin and Bolton 1986; Kirschenbaum 1996) has linked disaster to rational calculus theory and, while cost-benefit analysis may be involved, structuration better accounts for the significant role social structure plays on constraining agents choices. Although other theory, most notably Bourdieu and Elias (Bourdieu and Passeron 1977; Bourdieu 1977, 1986; Bourdieu and Wacquant 1992; Elias 1978, 1991), takes a meso-level approach, useful for understanding the tension between structure and agent, these theories tend to emphasize contextual cultural aspects that may be under significant transformation during the disaster process. Structuration, on the other hand, conceptualizes culture not as inherent within social arrangements but specifically tied to the mobilization of resources (Giddens 1984). Thus, the ability to maintain or possess resources within a specific context provides power to agents or to the structure (Giddens 1984). Therefore, structuration provides a useful context for understanding processes in which agents interact within a social structure to either reify or reform structures and social systems. Although this research tends to focus on dominant relations, an important question becomes; how are individuals with few resources and little power constrained by their inability to reform the social system?

In order to address this question it is important to understand an important component of social processes that is largely absent from structuration: social capital. Social capital, as a concept in sociology, has come to mean many different things to many different research programs and researchers. Initially social capital was conceptualized by Hanifan (1920) to describe tangible assets among individuals and families that make up a social unit; however, the concept did not matriculate into popular usage until Coleman, Katz, and Menzel (1966) used social capital to describe how cultural diffusion occurs within communities and influences life course outcomes. In the 1970s Granovetter (1973, 1974) empirically demonstrated how social networks result in individuals receiving jobs as a result of their social relations or social capital. In the 1980s Bourdieu (1986) demonstrated how social capital, the aggregate of actual or potential resources that are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition, can be transformed from social relation benefits to economic advancement to cultural distinction.

More recently, as social capital research continues to proliferate, it began to extend to disaster studies. Although Bolin (1985) identified the importance of social support in disasters, Dynes (2002) highlighted the importance of social capital in disaster response. Similarly, Hurlbert, Beggs, and Haines (2001) demonstrated how social networks and social capital functioned in the aftermath of Hurricane Andrew. To date, however, the most substantive treatment of social capital in disasters stems from Ritchie (2004), who investigated loss of social capital in the

Cordova community following the *Exxon Valdez* oil spill. This research builds upon previous contributions and conceptualizes social capital as the ability to utilize resources from an agent's social network (Burt 1992; Ritchie 2004). Although individuals may have a *resting potential* in their network or social relations or ties that they are unable to procure resources through, this research is focused primarily on the *active potential*, or the ability of individual agents to maximize social resources in a given context. Therefore, as a practical issue, what good is a social tie to the individual, if the individual is unable to access it for resource utilization within the disaster context?

Taken together, structuration and social capital offer a powerful theoretical lens for understanding the social processes of stratification at work for individuals during a disaster context. However, before an analysis of these results can be presented, some background surrounding the event of Hurricane Katrina is necessary. Since the overwhelming majority of evacuees reported about in this research resided in New Orleans and the several surrounding Louisiana parishes, this background focuses primarily on the major events occurring in this area before, during, and in the aftermath of Hurricane Katrina.

Background

On Saturday, August 27, 2005, Max Mayfield, Director of the National Hurricane Center, contacted Louisiana Governor Kathleen Blanco and New Orleans Mayor Ray Nagin to express his extreme concern about the imminent threat posed by the rapidly intensifying Category 3 Hurricane Katrina (Lush 2005; Nigg, Barnshaw, and Torres 2006). In response, Mayor Nagin called for a voluntary evacuation of New Orleans and, on August 28, ordered the first mandatory evacuation in the history of the city of New Orleans (Dunne 2005; Russell 2005; Schleifstein 2005). Subsequently, many of the presidents of the surrounding Plauqemines, Saint Bernard, Saint Charles, Lafourche, Terrebonne, and Jefferson Parishes urged residents to evacuate (Nolan 2005). Of the more than 460,000 residents of New Orleans, it was estimated that between 100,000 and 120,000 residents were unable to evacuate prior to Hurricane Katrina because they did not have access to personal transportation (Laska 2004; Renne 2005; U.S. Census Bureau 2005).

Demographically, New Orleans is a city that is approximately 67 percent African American, 28 percent white, 3 percent Latino, and 2 percent Asian (U.S. Census Bureau 2004). Although approximately 46 percent of citizens in New Orleans owned their own home at the time of Hurricane Katrina, there are considerable levels of concentrated poverty within the city (U.S. Census Bureau 2004, 2005). The median household income for New Orleans was $27,133, and over 27 percent of New Orleans lived below the poverty line (U.S. Census Bureau 2005).

As Hurricane Katrina escalated to a Category 5 storm on August 28, authorities established the Louisiana Superdome as the "refuge of last resort" for residents unable to evacuate New Orleans (Russell 2005). According to the Louisiana Office of Emergency Preparedness, a last resort refuge is "a place for persons to be protected from the high winds and heavy rains from the storm. Unlike a shelter, there may be little or no water or food and possibly no utilities. A last resort refuge is intended to provide best available survival protection for the duration of the hurricane only."

Although the Superdome was considered a refuge of last resort, the Louisiana National Guard delivered three truckloads of meals ready to eat, enough to supply 15,000 people for three days (Russell 2005). For several hours on August 28, New Orleans buses were deployed to assist in transporting residents to the Superdome. However, despite the emergency operations plan calling for New Orleans to utilize several hundred school buses, they were not deployed because the city was unable to find drivers (DeBose 2005). By the time Hurricane Katrina made landfall on August 29, an estimated 9,000 residents had sought refuge in the Superdome, while an additional 3,000 people were housed in 45 shelters opened by the American Red Cross (Russell 2005).

Although conditions in the Superdome appeared less than optimal at the time, it seemed that it would serve as an adequate shelter of refuge since there were not injuries or fatalities there directly resulting from Hurricane Katrina (Nigg et al. 2006). However, on August 30, the Seventeenth Street Canal was breached, resulting in significant flooding and the relocation of approximately 18,000 residents to the Superdome and approximately 20,000 more to the New Orleans Convention Center, which was not a refuge of last resort but served as a reception center for displaced residents (Russell 2005). As conditions deteriorated inside the Superdome and the New Orleans Convention Center and the numbers of evacuees continued to swell to 46,000 between the two sites, Governor Blanco ordered the entire city of New Orleans to be evacuated on August 31. Although there were widespread media reports of deteriorating conditions at the convention center, both FEMA Chief Michael Brown and Michael Chertoff, secretary of the Department of Homeland Security, claimed to have no knowledge of the center being used as a shelter until September 1 (O'Brien 2005).

As the orders to evacuate the Superdome and convention center were being given, it was announced that the Reliant Astrodome in Houston, Texas, would serve as a site for evacuees from New Orleans (Harris County Joint Information Center 2005a). By September 1, this news prompted a convergence at the Superdome where as many as between 30,000 and 60,000 people gathered, believing that to be the best place for evacuation from New Orleans (O'Brien 2005). Later that day, the

TABLE 1: Frequency of Hurricane Katrina Evacuees at Houston Mass Shelters, 2005

Date (8 a.m.)	Number of Citizens				
	Dome	Arena	Center	George R. Brown Center	Total
4-Sep	17,500	4,500	2,300	2,800	27,100
5-Sep	17,500	2,300	3,800	1,300	24,900
6-Sep	4,000	2,300	3,800	1,300	11,400
7-Sep	2,930	1,800	2,000	1,366	8,096
8-Sep	2,500	200	4,488	1,422	8,610
9-Sep	2,243	88	4,633	1,659	8,623
10-Sep	1,950	14	4,025	1,291	7,327
11-Sep	1,450	14	2,723	1,076	5,263
12-Sep	1,417	14	2,166	1,083	4,680
13-Sep	1,409	0	2,351	1,063	4,823
14-Sep	1,068	0	2,021	1,069	4,158
15-Sep	779	319	1,577	928	3,600
16-Sep	0	890	1,477	816	3,183
17-Sep	0	1,655	0	482	2,137
18-Sep	0	1,449	0	362	1,811
19-Sep	0	1,285	0	307	1,592
20-Sep	0	976	0	147	1,123
21-Sep	0	0	0	0	0

Source: Houston Joint Information Center (2005c).

first busload of evacuees arrived at the Astrodome in a school bus commandeered by a private citizen (Bryant and Garza 2005). Although the complete evacuation of New Orleans was only expected to last two days, the evacuation took longer than anticipated due to damaged infrastructure and overwhelming throngs, all seeking exodus from the chaotic scene. By September 2, officials stated that the Reliant Astrodome was holding approximately 15,000 evacuees while Reliant Arena was holding an additional 3,000, and the Reliant Center would be opened, which was

capable of housing up to 11,000 evacuees (Harris County Joint Information Center 2005b). Reliant Park is a sprawling four site property located in downtown Houston consisting of Reliant Stadium, which was not used for evacuees, the Reliant Astrodome, Reliant Arena, and Reliant Center, each of which became large shelters, as well as the George R. Brown Convention Center, located approximately six miles from Reliant Park. Although comprehensive statistics prior to this period are piecemeal, Table 1 indicates the number of Hurricane Katrina evacuees at the four mass shelters (Reliant Astrodome, Reliant Arena, Reliant Center, George R. Brown Convention Center) from September 4, when an official count was taken, to the close of the shelters at 7:00 p.m. CDT on September 20 prior to the landfall of Hurricane Rita (Harris County Joint Information Center 2005b). At its peak on September 4, 2005, the four sites sheltered approximately 27,100 Hurricane Katrina evacuees.

Two weeks after Hurricane Katrina, twenty-five states were involved in sheltering evacuees and, by September 30, evacuees were registered in every state and almost half of the ZIP codes in the United States. Three-quarters of evacuees stayed within 250 miles of New Orleans, but tens of thousands were more than 1000 miles away. With funds provided through the Quick Response Grant from the Natural Hazards Center at the University of Colorado at Boulder, research was conducted September 15–19, 2005, at Reliant Park to gather perishable data of evacuees' experiences and their intentions to rebuild or relocate in Louisiana in the aftermath of Hurricane Katrina.

Methods

Due to the highly exploratory nature of this research, it utilized many of the strategies from grounded theory (Glaser and Strauss 1999 [1967]) as well as many of the qualitative methodological techniques utilized in previous disaster research (Phillips 2002; Stallings 2002). Although exploratory, this research sought to investigate Hurricane Katrina survivors' experiences in evacuation, sheltering, and their intentions to return to the impacted area or relocate elsewhere. The author conducted and recorded 49 interviews in Houston, Texas, during September 15–19, 2005. Forty-six (42 African Americans and 4 whites, of which 25 were male and 21 female) of the interviews were Hurricane Katrina evacuees and three (3 white males) were key decision makers at Reliant Park, site of the majority of evacuees in Houston. Interviewees were purposely selected in mobile areas such as the free space outside of Reliant Arena and nonmobile areas such as the cots in Reliant Arena and Reliant Center. Interviews ranged in length from five to twenty-seven minutes. It is important to note that these interviews were conducted two weeks after the opening of Reliant Park as a shelter site and may not accurately

represent the population during that earlier period. Table 1 shows that there were nearly nine times as many evacuees when Reliant Park opened as compared to when these data were gathered. In the initial days Reliant Park served as a point of convergence where families and friends could reunite and temporarily relocate in hotels in the area or make alternate living arrangements with friends or family outside the impacted area. Therefore, the sample from which this research was drawn may overrepresent working class African Americans, the elderly, and those with physical or mental disabilities.

As a supplement to the research conducted in Houston, this paper draws upon additional quantitative research conducted among Hurricane Katrina evacuees, under the direction of Robert Blendon, at the Harvard University School of Public Health during September 10–12, 2005 (Kaiser Family Foundation 2005). Detailed methodology of this research has been published by Brodie and colleagues (2006 forthcoming). Although conducted three to five days prior to the qualitative research, the quantitative sample did not significantly differ in racial or class composition from the author's sample.

Findings

For many Hurricane Katrina survivors, issues of race and class, the lack of financial resources during the evacuation process, and fragmented social networks were highly salient issues. For many, issues of race *and* class were central to their evacuee experiences. Since New Orleans was approximately two-thirds African American when Katrina came ashore, several evacuees noted disproportionate concentrations of almost 90 percent African Americans at both evacuation sites in New Orleans and at Reliant Park in Houston. This stood in stark contrast to the law enforcement, support, and volunteer staff, which were predominately white. Some evacuees reported feelings of discrimination throughout their evacuation and shelter experience, ranging from perceived discriminatory statements made by public officials to being denied services due to race.

One working class African American, frustrated by the lack of government intervention following Hurricane Katrina, expressed these sentiments within a racialized and discriminatory framework. In the first section, the respondent expresses his frustration at being a U.S. citizen and being referred to as a refugee by Governor Bush of Florida:

> *And then I don't know if you heard on the news but the Governor Bush . . . Ok, he labeled us as being refugees. We are not refugees; we are United States citizens, right?*
>
> Yes.

> *Now, I wonder why when he [Governor Bush of Florida] got on the TV or makes a broad statement like that, "we housing the refugees" and some other man got behind him and said those are not refugees those people are United States citizens.*

In the second section, the respondent expresses his frustration at being denied service in hotels in Houston or being charged for hotel rooms that he had been told he could use 14-day vouchers for, hotel rooms made available by the American Red Cross.

> *I know my rights have been violated a lot here, you know, because I go to different motels and stuff and these people [hotel managers] suppose to, all we suppose to do is show our ID . . . We there, we from Louisiana, we homeless we don't have nothing. These people done charge us money for these rooms, a $120, I done paid all different types of prices and these supposedly give us 14 days free. The Red Cross are suppose to be taking care of these people.*

Statements concerning discrimination due to class were less often reported by evacuees. However, the survey also found support for the intersection between race *and* class as 68 percent of respondents thought that the federal government would have responded more quickly if more people trapped in the floodwaters were wealthier *and* white rather than poorer and black (Kaiser Family Foundation 2005). These perceptions of access and disparate treatment provide support for previous research highlighting both the perceived and actual benefits of white privilege in U.S. society (Feagin, Vera, and Batur 2001).

In addition, the disproportionate number of working class evacuees in the shelters highlights the issue of scarce financial resources. Evacuees frequently reported not having the necessary resources to evacuate prior to Hurricane Katrina and explained this was why they had been in the shelter for two weeks as opposed to living in a hotel in Houston like many middle class or upper class dislocated people were able to do.

Similarly, in the survey, although 73 percent of Katrina evacuees in Houston heard evacuation warnings prior to the storm, 61 percent did not evacuate prior to the storm, and 55 percent of those did not evacuate because they did not have a car or way to leave New Orleans (Kaiser Family Foundation 2005). Of those in the survey, 69 percent were brought to Houston as part of the government evacuation effort, challenging the assumption of Louisiana disaster plans that individuals should be responsible for their own evacuation (Kaiser Family Foundation 2005; Louisiana Operations Plan 2000). In addition, another 12 percent were either physically unable to leave, or had to take care of someone who was physically unable to leave, highlighting the significance and need for care of the elderly or those

with physical and mental disabilities within the disaster context (Kaiser Family Foundation 2005).

Many of the evacuees interviewed reported qualifying for Section 8 housing under the Department of Housing and Urban Development, while an additional subset were renters in the New Orleans area.

One working class African American woman, dislocated from her family and who qualified for Section 8 housing, decided to relocate to Houston in the hope that her family would reunite at some point in the future. As she expressed it:

> *Well, I have a voucher for a full bedroom. I've been on Section 8 for a year. I plan on looking for a house. I have my kin folks down here. They had a voucher but they couldn't find their voucher in the system so they told me to look for the full bedroom and find it and then they will come to us later and upgrade and give us a bigger house so that we can all stay together.*

Many of these individuals' choice to return may be severely constrained by the lack of available housing to renters in the New Orleans area or the uncertainty of work.

A working class African American man at first seemed certain of returning to New Orleans; he was, however, willing to relocate to Houston if he could find steady work, regardless of the fact that he had lived in the "Crescent City" his entire life:

> *Well, I want to go back to New Orleans whenever they give me the green light and because I have my job and, you know, everything established over there, but if I find a job and everything, get an apartment and get settled out here [Houston] and if I like out here, I'll stay out here rather than go all the way back to New Orleans.*

These findings are supported by the survey that found that 74 percent of evacuees earned less than $30,000 annually, 64 percent of them were renters, and only 12 percent intended to return home to rebuild when given permission (Kaiser Family Foundation 2005).

These findings masterfully demonstrate the principles of structuration and how agency may become severely constrained by social structures. Without access to adequate financial resources, people, despite adequate warnings, were unable to evacuate the impacted area. Conversely, those with financial resources and automobile transportation were able to evacuate New Orleans and stay in hotels throughout the Southeast.

Post-Katrina, the pre-existing social structure may have a disparate impact on future actions as those working class individuals, who are more likely to be renters, may be less likely to find housing and are less likely to be able to recover their personal possessions than those middle class or upper class homeowners. Thus, in the disaster context, stratification may be exacerbated for working class (as compared to middle class or upper class) families as they may have less access to recuperative resources such as homeowners insurance. In addition, future choices for some may be constrained by real property owners' decisions not to rebuild, leaving renters vulnerable and homeless.

Finally, many evacuees reported fragmented or spatially concentrated social networks. A fragmented social network is a series of loosely connected linkages that may not produce actual benefits (Burt 1992). Recall from the earlier discussion that this research is only concerned with *active potential* as it manifests itself as social capital. For example, suppose a working class resident in New Orleans rented five different properties over five years and was acquainted with five separate homeowners. Since none of the property owners had known the tenant for very long, it is unlikely that any of them would help this resident evacuate. It is somewhat more plausible, if the resident had rented from only one property owner for five years, that this network, though smaller, might provide a greater opportunity for activation of social capital to assist with the renter's evacuation in New Orleans.

A related feature of social networks is spatial concentration within social networks. Spatial concentration, or network density, refers to the linkages between ties within a given space or time (McPherson 1982; Wasserman and Faust 1994). Spatial concentration may be significant in the transfer of social capital, particularly within a disaster context as geography may influence access to resources.

A 53-year-old working class white woman stated that despite her five children and extended family, who all lived in the impacted area of Louisiana, she was not able to access her family network to assist her in evacuating or procuring resources in Houston:

> *I was at my sister Anna's house in Louisiana. Unfortunately, I was dropped off prior to that [Hurricane Katrina making landfall] at Salvation Army on South Claiborne right around Methodist Hospital, in that area . . . I was really upset about that. My kids left me behind, my five kids, they left me behind . . . you know, I thought, you know, people were suppose to pull together when things of this nature and this tragedy and this catastrophe happen.*

Many of the evacuees interviewed in Houston were working class elderly individuals with few friends and a fragmented social network. As a consequence, they

could not rely upon others for assistance in the evacuation process or secure provisional resources. Where a family may be able to send one member to wait in line for federal assistance, another to fill out a change of address form at the post office, and another to the store for supplies, individuals were often forced to navigate a new and emerging social structure alone, or make choices as to which resource was most important to secure that day.

One working class African American evacuee, separated from his entire family in Houston after two weeks, discussed the challenges of navigating everyday life with nothing:

> *I'm between a rock and a hard place . . . I have nothing. Nothing but the few clothes they gave me and that's it . . . At that time that's all we had 'cause we didn't have any place to wash our clothes. So I washed what I had in the shower . . . Then I had to take care of all my business [obtaining an identification card, change of address forms, FEMA and Red Cross debit cards] and I couldn't get nothing done. There was no way. And it feels like I don't even exist.*

The notion of social fragmentation is supported by the survey, which found that 92 percent of evacuees were attempting to find housing or a place to live rather than at the shelters in Houston (Kaiser Family Foundation 2005). In addition, evacuees were also attempting to find (in order of importance) other family or friends, a job, schooling for children, and medical care (Kaiser Family Foundation 2005). Conversely, individuals with greater financial or social capital had already located a place to stay and could move on to the other tasks that were competing with shelter evacuees' time.

Many also reported being a part of a spatially concentrated social network. Several interviewees were members of large families, sometimes of twenty or more, who all lived in New Orleans and Orleans parish and, as a result, were all affected by Hurricane Katrina.

For some, the evacuation of Katrina marked the first time they had left Louisiana as they did not have financial resources to travel and did not have family outside the state. This spatial density of social networks for these evacuees is illustrative of the difficulty of activating social capital even among large social and familial networks, if the networks are spatially concentrated in the impacted area. Additional support for this is found in the survey as 79 percent of evacuees reported that they did not have a friend or family member they were able to move in with until they got back on their feet. Conversely, individuals with extended social networks were able to utilize extended friends, family, and colleagues to stay in hotels, homes, or apartments in areas not impacted by Hurricane Katrina or Hurricane Rita. Thus,

their social capital could be activated and provide resources during the inoperability or destruction of their residence in New Orleans.

Conclusions

This chapter attempts to place the events surrounding Hurricane Katrina within a stratification context and illustrate the effects social structure has on individuals and their available social networks. After careful review of the existing disaster literature, this chapter argues that in contrast to most previous disaster studies, which treat disaster as an aberrant occasion resulting in the disruption of the social system, disaster provides a useful context for stratification. Indeed, in order to avoid theories of middle range (see Merton 1994), it may be more useful to conceptualize disaster within a stratification context rather than to conceptualize disasters as abnormal disruptions, or conceptualize stratification within a disaster context. This issue is not one of semantics but of substantial importance. By highlighting issues of stratification within the disaster context, one is contextualizing stratification to the disaster event. Although one may end up with an adequate and parsimonious understanding of how stratification functions during a disaster event, that understanding is limited in its usefulness. By shifting the focus to disaster *within* a stratification context, one explores pre-existing stratification, how disaster may ameliorate or, as this chapter argues, exacerbate inequality, and then how the disaster event may compound inequality over time. Although this analysis progresses in a somewhat linear fashion it is likely that these issues are more fluid than presented here and contextual refinement may be necessary in future research.

In contrast to most previous disaster research, this chapter attempts to apply theory to substantive findings. Specifically, this research utilized structuration theory and social capital to provide insight into complex social processes present during a catastrophe such as Hurricane Katrina. However, it must be noted that the use of structuration theory here is cursory at best and further investigation into its application is necessary. Research conducted by Santos-Hernández (2006) may address the significance of structuration on vulnerability and provide more substantive insight into how individuals and social systems structurate, or create resources for domination, legitimation, and signification—critical issues in structuration theory, which are not addressed here. Rather, this chapter uses structuration to illustrate how individuals are constrained or benefit from pre-existing and existing social structure. In addition, it attempts to utilize the large sociological theoretical literature of social networks and social capital. It argues that social capital has both resting and active potential, but acting social capital may be the only beneficial form within the disaster context. Thus, although an individual may have a large

but fragmented network, or large but spatially concentrated networks, the transfer of social resources into social capital may not occur as a result of the disaster context. Future disaster research must take into account the effects of social capital, particularly within the stratification context, and attempt to explain variations attributable to fragmentation and to spatial concentration.

In addition, this research utilizes triangulation in an attempt to provide a fuller understanding of the processes of disaster within the stratification and inequality context. By locating in-depth interviews within the larger, more representative quantitative survey, this research attempts to show how both methods used together can provide a fuller understanding of the complex social processes resulting from Hurricane Katrina. Triangulation is an underutilized research method in the social sciences, particularly in disaster research. Although some of this may be explained by its cost-prohibitive nature, it is possible that perhaps fewer, more rigorous methodological studies may provide more substantive results than many small qualitative investigations or a few poorly executed quantitative investigations. Though broad in scope this research touches on many issues and attempts to break ground in new substantive areas in the hope that future research will follow the pioneering investigatory nature of the earliest studies of the early 1950s.

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In Their Own Words: Utilizing Weblogs in Quick Response Research

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Abstract

Weblogs (blogs) emerged in the late 1990s in the form of online diaries where individuals maintain accounts of their day-to-day experiences. However, the usefulness of weblogs in hazards research remains to be investigated. The purpose of this chapter is to reflect on the extent to which the current views portrayed in the literature, with regard to the effects of social vulnerability on disaster response, may be applied in the context of the Hurricane Katrina disaster as captured by weblogs. It is not to provide a comprehensive analysis of vulnerability and response following the disaster. Preliminary findings demonstrate some feelings of discrimination and inequalities were apparent but did not appear to be widespread. This suggests that, perhaps, issues such as gender equality and the needs of disadvantaged members are being adequately supported in certain contexts. The results also highlight the potential of new data sources such as weblogs for quick response research and how they may provide significant insights that complement or substitute traditional research methods that may not be feasible to conduct during the immediate aftermath period.

Keywords: social vulnerability, weblogs, quick response, Hurricane Katrina, research methods

Emerging out of military concerns following World War II, it is not surprising that natural hazards research in the United States has "emphasized order, social control, and predictability . . . consistent with conservative functionalist approaches in sociology of the 1950s" (Bolin et al. 1998). Here, disaster events have been traditionally discussed objectively as natural occurrences that impact human systems (Bolin et al. 1998). Individual victims are then "objectively constituted by common exposure to an environmental force and differentiated . . . only by quantitatively measured 'background characteristics'" (Bolin et al. 1998). It is suggested that this "gender-neutral stance" hides the true organization of social life (Enarson and Morrow 1998) and may distort the individual gender-specific experience of men and women.

With an increased interest in gender studies since the 1960s in many industrialized nations, it is interesting that most research in this area continues to arise from disasters in the developing world. It remains underanalyzed in the context of the United States, with many studies only introducing sex as a binary opposition to contrast the differences of men and women with respect to behavior or psychological stress (Bolin et al. 1998; Enarson 1998). Those studies have largely focused on the issues of women in disasters; the gendered experiences of men have been ignored by male and female researchers, not only in the United States, but throughout the world (Enarson and Meyreles 2004). Nevertheless, a review of existing literature implicitly suggests that differences in gender shape the responses between men and women both "within and outside formal response agencies" (Enarson 1998).

The underlying objective of the present chapter is not to introduce a grand theory or methodology concerning how the gendered experience in disaster situations needs to be accounted. Rather, the purpose of this chapter is two-fold. First, it emphasizes the need for a more holistic and balanced approach to gender analysis as it relates to social vulnerability and disaster risks. Second, it acknowledges the use of weblogs and additional online materials as valuable sources for studying and discussing the role of gender analysis and documents the degree to which these resources augment traditional formal surveys and interview techniques in hazards research. The emphasis of this research is, therefore, placed on providing a balanced view of the experiences of men and women in disaster situations in their own words more than on providing a comprehensive account of all gender aspects pertaining to disasters. To exemplify how this balanced view is to be accomplished using weblogs, a preliminary account of how gender influences vulnerability, response, and recovery in the context of the disaster induced by Hurricane Katrina on the Gulf Coast in 2005 is presented. The investigation leading to this account has been guided by the following two questions: (1) Have ongoing disaster response efforts in the Gulf Coast promoted social integration and support of disadvantaged groups? and (2) Have these efforts promoted gender equity?

This chapter has been structured to reflect the approach we have adopted in utilizing weblogs to seek a balanced view of the gender dimension in the context of the Hurricane Katrina disaster. We first review contemporary work on gender and disaster risks and highlight evidence from the literature in support of our argument regarding the need for a more balanced and holistic gendered analysis. Next, we present the methodology used to survey weblogs and additional internet resources produced during the immediate aftermath period following Hurricane Katrina, based on the above two guiding questions of our investigation. We then present a synthesis of the findings of our investigation, followed by a general discussion of integration issues of gendered perspectives and social vulnerability in disasters.

For the purposes of contextualizing subsequent discussions in this chapter, some important definitions need to be highlighted. "Ongoing disaster response efforts" refers to those activities in the postdisaster phases of recovery and reconstruction. The recovery phase is usually characterized by those activities that allow for the lives of individuals to return to normality, including rebuilding and allocating emergency resources (Fothergill et al. 1999). Though there is some overlap, the recovery phase precedes the reconstruction phase, in which the long-term reconstruction of the community takes place; this may include the processes of rebuilding, replacing lost infrastructure, obtaining financial assistance, and finding permanent housing.

Corresponding Literature

Questions related to disaster response and recovery efforts have been largely limited to areas located within the developing world where marginalized groups are realized to have an "increased and unrecognized burden and suffer higher levels of mortality and morbidity in disasters and emergencies" (Fordham 1998). These impacts are then contrasted with those in developed nations and expected to be proportionately less due to the presence of existing vulnerability reduction programs, including health care systems, high standards of living, political rights, and antiviolence sheltering systems (Fordham 1998; Enarson and Meyreles 2004). Indeed vulnerable populations may be (somewhat) buffered through a state-controlled benefit system in more developed nations, but research suggests that a similar model of disproportionate impact also exists due to underlying social structures that reinforce pre-existing divisions (e.g., gender, class, and race) at all stages of a crisis situation (Fordham 1998). A serious gap seems to exist with respect to this area in disaster response and recovery in more developed nations.

Living the Disaster

Despite the scarce literature related to developed nations, our review of available studies recognizes some patterns relating to issues of emergency response and recovery efforts, including questions of social integration, support, and gender equity. With respect to the responses of individuals living the experience, Enarson and Scanlon (1999) suggest that little research has been done on understanding evacuation or other disaster actions as explicitly "gendered social experiences" (Enarson and Scanlon 1999). Of the literature that has described this, (e.g., Fothergill 1996; Anderson and Manuel 1994; Johnston and Johnson 1989), studies found significant gender differences in perceptions of risk activities before, during, and after the disaster, as well as in reactions to stress. Typically, "these differences are attributed (whether explicitly or implicitly) to gender role expectations and socialization" (Alway et al. 1998). In their study of Canada's Red River flood of 1997, for instance, Enarson and Scanlon interviewed Red River Valley couples who both evacuated and had caregiving responsibilities for others to capture a "his and her" disaster experience (Enarson and Scanlon 1999). After analyzing the stories they obtained, the researchers concluded that the men and women were more alike than different before, during, and after flood evacuation. This was largely due to a shaping of the experience by the local flood subculture, as well as other socioeconomic factors (e.g., class, ethnicity, etc.). When differences did arise, however, the researchers found they were deeply embedded in gender differences, "not only in gender-segregated disaster work but in gender power" (Enarson and Scanlon 1999), an inequality that arose due to embedded gender relations that privileged the voices and actions of men in a crisis situation (Enarson and Scanlon 1999).

Emergency Response Agencies

In emergency response, women tend to work outside of the boundaries of formal disaster agencies. Research in the United States, for instance, has described the efforts of women in forming short-lived coalitions to respond to social needs of communities (e.g., Neal and Phillips 1990; Enarson and Morrow 1998). These groups have been generally found only to appear in the case of widespread disasters that dismantle the pre-existing social structure and challenge the existing disaster relief network's ability to adapt to meet the needs of the community in crisis (Wilson and Oyola-Yamaiel 1998). More often, women organize into groups based upon pre-existing informal network structures. These less formalized groups have been largely discounted or ignored by industry, the media, and public policy makers, however, due to perceptions of group members as only "concerned mothers" or "a bunch of hysterical housewives" (Neal and Phillips 1990).

A gendered division of labor also appears to indirectly affect the roles of men and women in disaster response and recovery efforts. Since women's roles have been

traditionally related to caring and nurturing, their use as a resource in emergency management situations at all levels has historically been overlooked. Even when women participate in emergency management positions, they tend to reside outside the "old boys network" and "their ideas may be overlooked or perceived as suggestions rather than orders" (Scanlon 1998). This is potentially problematic since those male-dominated groups, viewing the disaster through a male-tinted lens, may fail to address specific needs of women (Enarson 1998). Because disaster planners are generally male, it may be easily assumed that women's time and emotion may be utilized for work as caregivers, as "much as they assume male physical strength, access to tools and home maintenance skills" (Enarson 1998). Because these assumptions have not generally been articulated or empirically tested, researchers need yet to consider these areas in order to completely understand how the gendered division of labor affects the emergency response and recovery processes.

Gendered Experiences of Men

A review of the literature imparts an image of a disaster in which women face increased vulnerabilities because of the "arrangements of societies that result in their poverty, political marginalization and dependence on men" (Anderson 1994). This is of notable importance, but, by its very nature, research pertaining to gender should reflect differences between and among women and men. Because a greater number of female researchers have heeded previous calls to research pertaining to the "gendered terrain of disaster," the gender-specific experiences of men have, until recently, remained largely unexplored (Enarson and Morrow 1998; Enarson and Meyreles 2004).

Interest is growing; since the late 1990s, a number of researchers have begun to explore the gendered experiences of men. These perceptions are seen in couples-focused research, including Alway et al.'s study of gender and disaster among heterosexual couples before, during, and following the Hurricane Andrew disaster, (Alway et al. 1998) and Enarson and Scanlon's (1999) study of the gendered patterns of flood evacuation among heterosexual couples in Manitoba's 1997 Red River Valley flood. Interviews of 100 Australian farmers, men and women, were also conducted separately by Stehlik et al. in order to identify "themes of difference" and conclude that gender is still a relevant variable in studies of the social impacts of disaster (Stehlik et al. 2000).

Further, the studies that have explored the gendered experiences of men predominately relate to those experiences of men in developed nations. According to Enarson and Meyreles (2004), one significant exception may be found in the developing world, the investigation by Enrique Gomáriz. Though this investigation analyzes

the situation of men only as a part of a "more profound analysis of women's vulnerabilities and capacities" (Enarson and Meyreles 2004), it found men were more likely to lose their lives following the Hurricane Mitch disaster due to a gendered division of labor that "accorded men risky places, tools, and tasks" (69).

Weblogs versus Traditional Data Collection Methods

The present research draws upon the personal experiences of survivors and relief workers as they were published on the Internet. The adoption of an Internet-based survey to carry out this investigation was motivated by two primary factors. First, financial constraints prohibited a "quick response" trip to the Gulf Coast region during the immediate aftermath phase following the hurricane. Secondly, we had an interest in attempting to explore nontraditional methods in capturing the gendered experiences of individuals following a disaster situation.

Compared to a decade ago, researchers now have instant access to vast quantities of information about our world: from disasters and weather events, to demography, economic and social conditions, and culture. New Internet resources, including Wikipedia and online articles, supplement and (oftentimes) replace not only the traditional browsing of library shelves but also the way "facts" are collected and documented. Although information found in these resources is often intertwined with commentaries, personal notes, and other kinds of "noise" that present a challenge for researchers, valuable information may be obtained. The potential for utilizing the Internet as a tool for data collection, analysis, and dissemination is immense and provides some advantages over traditional methods of data collection (i.e., face-to-face interviews, distributing questionnaires, etc.). This is particularly valid in such cases as quick response research when data are often of ephemeral nature and need to be documented in a time-sensitive manner.

Researchers have documented some of the problems associated with more traditional social science research methods. This includes Taylor (2005), who noted problems associated with very small sample sizes, nonrepresentative samples, the timing of research studies, biases associated with the experimenter and data collector, and applicable costs. Several of these problems may be resolved through what Taylor (2005) refers to as Internet-Mediated Research (IMR). For example, assembling a large and diverse sample may be less difficult and costly utilizing online resources (e.g., electronic mail programs and online survey techniques). Opponents of IMR often note the technique's difficulty in controlling the study environment, the self-selected nature of participant sampling (and hence increasing the risk of obtaining a nonrandom, nonrepresentative sample of the general population), as well as an inability to directly monitor individual participants. However, many of these aforementioned weaknesses may be avoided by taking

precautionary measures. Further, these perceived disadvantages are likely advantages in some studies, including the present research in which an unstructured, uncontrolled narrative of the disaster experience is required to obtain a more insightful account of differences and similarities as individuals experienced the immediate impacts of a disaster.

Research Methods

In obtaining the data, "first-hand" and "second-hand" experiences from relief workers were gathered from 15 weblogs, 4 published stories in newspapers and magazines, and 3 published accounts from aliveintruth.org (an all-volunteer, grassroots organization that maintains a publicly accessible database of direct oral and written accounts of those involved in the Hurricane Katrina disaster). First- and second-hand accounts from survivors were drawn from 12 weblogs, 24 published stories from aliveintruth.org, and 6 published accounts from newspapers and magazines. Due to the time sensitive nature of the data, stories were collected in the immediate aftermath of the Hurricane Katrina disaster during the period of October to December 2005, with additional updates obtained through March 2006. The research attempted to minimize the use of second-hand accounts whenever possible to account for, as much as possible, the direct experiences of individuals. Data were primarily obtained using the key phrases "personal experience and Katrina" and "first hand experience and Katrina" in a search of weblogs and websites using Google's blog search engine (http://blogsearch.google.com/) and the Google search engine (www.google.com). Publications were selected from those found by the Internet search engines and read for relevancy. After determining whether the content directly related the experiences of Hurricane Katrina survivors and relief workers, we then performed a more detailed reading in which the writings were carefully examined for particular key words and phrases, including "prejudice," "gender," "relief," "discrimination," "equity," and "equality." Specific content related to the treatment of survivors in shelters, by volunteers, and their perceptions of treatment, including that demonstrated by the military and by community members in areas where survivors were evacuated, were also noted to determine the existence of patterns across the groups. Stories were drawn from both men and women between the ages of 18 and 90 years old, from a variety of socioeconomic classes; individuals were primarily of either African American or Caucasian race. Because much of the data was obtained from Internet weblogs, it is possible that this sample does not represent the entire population of the Gulf Coast region.

Because the research has drawn directly upon the written accounts of individuals, and (to a great extent) their own words, which color and enhance their

experiences, the following reflections will often utilize the exact language of individuals in order to attempt to reproduce these experiences in the context of disaster response, relief, and recovery efforts. In utilizing these stories, we have only included emphasis in brackets where necessary to provide clarification. As it was stated or described in the source, through words or images, the gender, approximate age, and race of the individual (if known) has been included in addition to the individual's name. This has been done to better establish patterns across the various disadvantaged populations.

Reflections on Hurricane Katrina

In reading and analyzing the first- and second-hand experiences of volunteers and survivors of Hurricane Katrina, several patterns appeared evident. The stories published by and about individuals volunteering with smaller relief agencies generally showed enthusiasm in helping hurricane survivors. These accounts appeared to show no bias or discrimination toward individuals of various economic, social, or gendered groups; it appeared that individual volunteers and organizations, especially smaller ones from outside the region, were attempting to best support these disadvantaged groups.

Relief Workers' Experiences

In attempting to garner assistance to survivors Melissa1 (female) states on Monday, September 5, 2005:

> *It is incumbent upon ALL OF US to assist in whatever way we can . . . Not all of us can give money, or volunteer a lot of time but every one of us can elevate our thoughts above issues of race, poverty, hopelessness and helplessness to give these displaced thousands less resistance while they rebuild new lives for themselves in the wake of Katrina . . . The law of reciprocity works like this: The Folks of the South, for better or worse, have always been a people, color is no barrier here, of outstanding hospitality. Some may have had experiences as individuals where this does not bear out. As a generality, a broad sweeping stereotype, a categorization—the South has been the Home of Hospitality. Therefore it is our job to reciprocate in kind and be hospitable to those who are in need (McGuire 2005).*

Though Melissa was not directly involved in the volunteer efforts, this same outlook was seen in writings from other, directly involved individuals, including in an account by Ziggi, a volunteer working to provide wheelchair repairs in Baton Rouge, Louisiana, following the disaster. After returning on September 28, 2005, Ziggi writes:

> *It was an amazing experience that left a lasting impression on me. I had all along thought of this disaster in terms of this massive and destructive act of nature. It is in fact a much different thing. It is very much about people. The clients we worked with were unbelievable. All were people with a disability or in many cases multiple disabilities . . . All were kind to each other and showed concern, helped each other, had patience, and made the best of it (Ziggi 2005).*

Jon M. (male, Caucasian), a registered nurse and International Medical Corps volunteer assigned to the St. Charles Parish Health Center following Hurricane Katrina noted that the

> *hardest challenge to overcome in any humanitarian effort is the personal feeling of not being able to do enough . . . The successes are easily measured by the smiles and true gratitude given to us by people who have lost everything. This, after providing them with what seems to us as very little but to them is of dire importance (Mason 2005).*

Some relief volunteers appeared to go beyond their responsibilities. Caroleeena (female, Caucasian) attempted to garner support from the online community, to get Alan, a hurricane survivor living in a Raleigh, North Carolina, shelter, employment as a carpenter: "He is driven to create a new life here [in Raleigh]. He wants work. He strikes me as someone who would work his ass off. If anyone has work, I would be happy to put you in contact with him" (Caroleeena 2005).

Ginger (female, 33 years old) and a male companion, Av, from Alabama, ignored requests by the Red Cross telling individuals not to bring supplies into the area, and instead write checks,

> *As we found with other hurricanes, this really doesn't work so well if you are already in the area and are able to help, because the Red Cross can't get to everybody and well, neither does the government. If you live in Seattle and want to help hurricane victims, then yes—write a check. But if you live in a neighboring state or are far enough away so that you have the means to bring help to people, that's really a good thing. People suffer if not. I know the Red Cross would hate to hear someone say that, but that's been my experience. Neighbors get there, and know the area, best (Ginger 2005).*

Having previously experienced hurricanes, Ginger and Av directed supplies to smaller communities, including Biloxi and Ellisville, Mississippi, as they "heard after Hurricane Ivan that smaller, less-known communities hurt more because aid wasn't directed at them at all" (Ginger 2005). In Ellisville, these two relief workers were escorted by the local police to a school to distribute supplies:

> *While we pulled up to the school, he [the Ellisville police chief] told the people there on his speaker to get in a line to receive supplies. No sooner had we turned off the engine now that we were in an adjacent parking lot, but there were more than a dozen cars already in line. We gave them everything we had. They were *so* appreciative. It was like being in a dream where a hundred things are going on but you just stand there watching, not knowing what to say. All I could make out was "God bless y'all." Unbelievable. The police chief said to everybody in line, "I want y'all to know this isn't the government, this isn't from FEMA. These people drove here from Alabama." Nobody from the government or the Red Cross had been there [by Saturday, September 3rd]. We left and I rolled down the window and said, "do y'all need us to be here again tomorrow?" and he said that absolutely, they do (Ginger 2005).*

Other relief volunteers related similar experiences, including one relief worker who "escorted an evacuee family (two parents, five kids) around the [Astro] dome to sneak them in so they could search for their relatives" (Ingold 2005a) and a nurse who "put out an SOS for a computer" in her attempt to better organize patients at Kelly Air Force Base in San Antonio, Texas (Brizollara 2005).

Not all the experiences of volunteers were positive. Nearly all were distressed about the amount of disorganization they encountered when trying to deliver their services to those in need. Kate I. (female, Caucasian) a volunteer working in the Houston Astrodome reported in a post dated Thursday, September 8, 2005:

> *I'm so sick of how rule-based we've become, so obsessed with bureaucracy. It's completely nuts and proving to add more disaster to existing disaster. Even the Red Cross falls prey to The Rules, but at least they have an excuse since they are volunteer-driven (Ingold 2005b).*

This attitude is continued in her report dated Friday, September 9, 2005:

> *Speaking of FEMA, they're busy making life more difficult for many here in Houston, just as the Red Cross and the local community are getting more and more organized and helpful to evacuees. Part of the parking lot has been cordoned off for FEMA, who seem much more concerned with snacking and looking important in their secluded 2nd floor hallways (no longer open to evacuees, btw) than actually working. All of the makeshift federal offices at the dome close down precisely at 5, regardless of how many people are still standing in line waiting (often for hours and hours) to talk to someone about housing, unemployment, insurance, or whatever the hell FEMA is in charge of. In order for the bureaucracy to maintain itself it must obey all the rules, and the rules say that they work from 9 to 5 and not a minute later, no matter the need or situation (Ingold 2005c).*

A second-hand account in a weblog from Benjamin P. (male) of Provo, Utah, provides a similar perspective. According to John D. (male), in order for his friend to be a volunteer with FEMA, it was necessary for him to "complete this class before being sent into the disaster area." The schedule for the first week of "this class," included training in sensitivity issues. The first week of the course concentrated on diversity awareness, harassment awareness, profiling avoidance, GLBTQA (gay, lesbian, bisexual, transgendered, questioning, and asexual minorities), and liability issues. It included an orientation to a variety of topics that appeared to educate individuals on promoting social integration and equitably supporting disadvantaged groups, including providing volunteers with basic Spanish language instruction and awareness of sexual harassment issues, training to prevent "oppression and discrimination toward orientational minorities," and a "one-hour written test to screen volunteers for Islamophobia." It is worthwhile for all volunteers to undergo this type of training to ensure the equitable delivery of goods and services, but this writer found the amount of training to be excessive, concluding that "bureaucracy always sucks. The government is so bloated that it takes forever to do anything" (Peisch 2005).

This attitude appeared especially prevalent among individuals working as volunteers within larger organizations, including Major John (male, Caucasian), serving in the National Guard, and Brian B. (male), a Red Cross volunteer. Major John writes:

> *The biggest problem was trying to unite "54 little armies" . . . under a single command, and with a single direction. Each State's command authority (Governor and Adjutant General) was the ultimate say so on when units came and went. When we ended up with too many transportation units, for example, some were withdrawn by their State. We struggled to keep up with what units were present and who was commanding or supporting which units (Major John 2005).*

Both men related they felt a "sense of purpose and significance" (Brian B. 2005) in doing menial tasks in order to help others in need, but Brian B. specifically discussed the need to ensure proper organization within the relief agency, as well as other agencies (e.g., FEMA, AFL-CIO, and HUD), in helping individuals rebuild their lives:

> *Quite frankly, on an organizational level, the efforts. . . left something to be desired. It's not that we [the relief workers] didn't want to help, and it's not that we didn't have help to offer, but the actual process of delivering that help was chaotic . . . My last day at the shelter [September 16, 2005] was the FIRST day it was visited by a FEMA official. It was Wednesday or Thursday of LAST WEEK [September 14 or 15] when a representative of the AFL-CIO showed up (Brian B. 2005).*

This attitude was not lost on those who remained in the Gulf Coast Region, especially within the city of New Orleans, awaiting immediate relief and evacuation after the hurricane made landfall. Upon his evacuation of New Orleans, Jordan F. (male) a New Orleans resident and editor of *Left Turn*, an activist publication, described the scene in one refugee camp on the I-10 freeway near Causeway:

> *I traveled throughout the camp and spoke to Red Cross workers, Salvation Army workers, National Guard, and state police, and although they were friendly, no one could give me any details on when buses would arrive, how many, where they would go to, or any other information. I spoke to the several teams of journalists nearby, and asked if any of them had been able to get any information from any federal or state officials on any of these questions, and all of them, from Australian tv to local Fox affiliates complained of an unorganized, non-communicative, mess. One cameraman told me "as someone who's been here in this camp for two days, the only information I can give you is this: get out by nightfall. You don't want to be here at night."*
>
> *There was also no visible attempt by any of those running the camp to set up any sort of transparent and consistent system, for instance a line to get on buses, a way to register contact information or find family members, special needs services for children and infirm, phone services, treatment for possible disease exposure, nor even a single trash can (Flaherty 2005b).*

Survivors' Experiences

Besides observations about a lack of social integration and support, the stories of survivors reflected feelings of humiliation, anger, fear, inequality, and had them questioning whether "the lack of support [by the government] was deliberate" (Homan 2005). Attending a conference in the French Quarter, paramedics Larry (male) and Lorrie Beth (female) found themselves in New Orleans after the storm came ashore. After one failed attempt to leave the city by bus, the paramedics, along with a group of 200 or so others, attempted to walk the Pontchartrain Expressway and cross the greater New Orleans bridge where they had been told by a New Orleans police commander that buses would take them out of the city. They reported:

> *As we approached the bridge, armed Gretna sheriffs formed a line across the foot of the bridge. Before we were close enough to speak, they began firing their weapons over our heads. This sent the crowd fleeing in various directions. As the crowd scattered and dissipated, a few of us inched forward and managed to engage some of the sheriffs in conversation. We told them of our conversation with the police commander and of the commander's assurances. The sheriffs informed us there*

> *were no buses waiting . . . We questioned why we couldn't cross the bridge anyway, especially as there was little traffic on the 6-lane highway. They responded that the West Bank was not going to become New Orleans and there would be no Superdomes in their City. These were code words for if you are poor and black, you are not crossing the Mississippi River and you were not getting out of New Orleans (Bradshaw and Slonsky 2005).*

Unable to remain in her house any longer, Carol Y. (female) spent five days at the New Orleans Convention Center awaiting rescue.

> *In was hard, hard, hard out there in New Orleans because even the police got their families out ahead of time. The mayor got his family out ahead of time. Bush [the president] wasn't there so he don't know what the hell went on in New Orleans. The only thing he did was give the orders to shoot to kill. We not no animals. So I can understand you want to keep control of the people, but why have those people draw guns on children? Women with babies in their stomachs. Every time you look around we breaking and running, trying to get into the Convention Center and they're drawing guns on people like that. I mean, it don't make no kinda sense. It didn't, it really didn't (Carol Y. 2005).*

Debora J. (female, 48 years old) and her ten-year-old daughter remained in the city of New Orleans for five days without food or water. After seeing children and elderly people die, as well as murders and rapes, and feeling like a prisoner, Debora J. described the day when the troops finally came. Rather than a reaction of relief, however, she reported one of frustration and anger:

> *[This experience] was the most horriblest experience I have ever seen in my life . . . on the fifth day . . . They fly in in their helicopters. The first thing they dropped into us was boxes of cigarettes. Not food. Not water. Boxes of cigarettes. Two hours later they drop us water. They dropped it. And half of it burst open cause they was so high up when they dropped it. Two hours after that they drop us some army food in a box we got to pour water in to heat up. We was hungry, we had no other choice. It [the experience] was horrible . . . I think the government failed us. I think the mayor failed us, I think the government failed us. I think our president failed us. They can't give us enough money to replace what they took. They can't (Debora J. 2005).*

Having no money and no working vehicle to leave the city before the storm, Antoinette Seven (female) and her family walked in neck-deep water to make their way to the convention center where they had been told that a bus would transport them out of the city. Here, Seven saw babies "piled up in the bathroom dead," a girl raped, and several men murdering the alleged rapist. All the while,

> *the police lock us in there [the convention center] and pointed guns at us. They made us kneel and then lie face down while they held the guns over us . . . Babies was dying and I couldn't help. Old people was falling down dead. We told the police babies was dying and they said "So what? What the fuck can we do? They're dead." The news got us out. Not the National Guard, not the Mayor, not Blanco, the news people is the only ones who got us out. Channel 26 got me out. They got me out in they helicopter. Channel 26. The rest of them was there to kill us (Antoinette Seven 2005).*

These stories of injustice were not limited to the women and their families. Soldier Man (male, 46 years old, African American), Ed B. (male, older, Caucasian), and Larry (male) described the period of time they waited in New Orleans to be evacuated. All described feelings of fear and frustration toward law officials and other personnel. Waiting a "week, or two weeks" for a helicopter to evacuate him, even though he saw them flying around, Soldier Man related his belief that racism was prevalent among the immediate rescue workers:

> *I can't believe, lived and born in America all my life, I can't believe how wicked people could be. I know there's a time coming for a change in this world because the people in America was racist, sir. We waited a mighty long time for a helicopter to come and pick us up. They was flying around . . . I served my country all my life. I never was a racist man. I love everybody. I work all my life in New Orleans, help anybody . . . white, black, Chinese, Filipino, Jew, because God had told us to love (Soldier Man 2005).*

Evacuated to the Superdome before leaving New Orleans for Austin, Texas, Ed B. describes his experience with some National Guard personnel:

> *And so the next day, they got all these National Guard trucks outside, and the next day wasn't too bad because we just decided to stay outside [the Superdome]. The day after that, about twelve trucks are leaving. I walked over to one of the trucks and asked the guy, I said, "Are you leaving?" He pulled his gun out, he said, "Get away from the truck." National Guard. I said, "Whoa, wait a minute, man I'm just—I don't—" It freaked me out, I didn't know what to think (Ed B. 2005).*

Unable to reside within his apartment complex following the hurricane, Larry (male), his family, and a group of upstairs neighbors, made their way to the New Orleans Convention Center, where they found "nightmarish conditions"; he took it upon himself to confront individuals attempting to accost the group. As related to a volunteer, within a few days,

> *word started to spread among the crowd that they weren't being rescued because they were all contaminated and were considered a threat to others. During the last night they were there, an explosion was heard nearby, the sky was full of smoke and they could see several fires burning around them. They had heard planes overhead. The people in the center believed that the U.S. government was bombing the city to eradicate their disease potential. He decided that night that when daylight came he had to seek shelter elsewhere.*

Finding an abandoned house, Larry went back to the convention center and got the rest of the group, they now numbered two men, three women, and thirteen children. He and the other man found an office building, previously broken into, where they found several bottles of water and food items from a vending machine, as well as a machete on the street. He and the other man then took turns "sitting outside the front door with the machete to be sure the women and children were protected." The following day, Larry's friend found a large lot filled with eighteen wheeler trucks, and the two men stole a truck and returned with their group to the Convention Center, where Larry was

> *again [horrified] by what he saw, bodies around, most not even covered. Many of the people he approached were afraid to come with him. He estimated that maybe close to a hundred people finally left with them in the truck. They managed to get to a place where they saw planes landing and flying out. He said that their little group of eighteen along with about thirty others was put on a Navy jet. They didn't know where they were going until the plane was in flight. Then they were told that they were being brought to Austin (Larry 2005).*

Survivor stories appeared to generally support those conditions reported by the U.S. media at the Super Dome and New Orleans' Convention Center, but some noted a disconnect in how the information was being conveyed, perhaps contributing to a lack of social integration and support in the immediate relief efforts. This included the "looter/finder distinction" in describing black and white individuals removing items from New Orleans' retailers immediately following the hurricane (McClure 2005). Reporting from the Houston Astrodome, Bookman (male, African American) writes,

> *The people of N.O. [New Orleans] are being stereotyped by how they look & the things that happened prior to Katrina.. . . I just Want to let the world know . . . WE ALL AIN'T VIOLENT PEOPLE! That looting Stuff was a One Time Thing . . . Infact we were laughting (sic) at them also (Bookman 2005).*

These types of differences in media presentation were further reflected in the reports of several survivors and relief workers, one of which agreed with a friend writing:

> *The media is the handmaiden of the devil. It is. There has been a tragedy of immense proportions in the United States; one which in geography, loss of life and economic impact dwarfs 9/11 [2001]. And true to form, every media outlet and every reporter are salivating at the opportunities for criticism, and the hope that some even greater catastrophe will befall those who have already suffered so much (Sporklinger 2005).*

An email written by Robert LeBlanc (male) was posted on several blogs, titled "The Positive Stories Must Get Out"; the author relays his personal experience in the immediate New Orleans' rescue operation:

> *In my opinion, everything that is going on in the media is a complete bastardization of what is really happening. The result is that good people are dying and losing family members. I have my own set of opinions about welfare and people working to improve their own lot instead of looking for handouts, but what is occurring now is well beyond those borders. These people need help and need to get out. We can sort out all the social and political issues later, but human beings with any sense of compassion would agree that the travesty that is going on here in New Orleans needs to end and people's lives need to be saved and families need to be put back together. Now (LeBlanc cited in Mid-South's Response to Katrina 2005).*

Finally evacuated to regions outside the hurricane affected area, survivors' comments generally appeared positive in the support they received from individuals, community members, volunteer organization, and shelters. Bookman, writing from a makeshift computer lab in the Houston, Texas, Astrodome constructed a list of things to do in the Astrodome, where he appears to amusingly describe his living conditions:

> *Too Many Sandwiches? DON'T EAT THEM!*
>
> *Too Much Water/Soda? Don't Drink It!*
>
> *Ever Get Bored? Keep Walkin'!*
>
> *Tired Of Walkin'? SIT DOWN!! GO TO SLEEP . . . WAKE UP AND START WALKIN AGAIN!*

> *Thats all you can do in this place. We dont have any cars. Nobody wants to eat the sandwiches. its like a "Too Much To Eat" Buffet. we have sandwiches, Snacks, and Drinks all over the place . . . they make lunch & dinner daily (Bookman 2005).*

Individuals living at the convention center in Austin, Texas, related similar stories. Miranda B. (female, 38 years old, African American) and Joyce W. (female), both survivors evacuated from New Orleans said the people and the hospitality in Austin had been wonderful and both had been treated with respect (Miranda B. 2005; Joyce W. 2005). Entering the city by plane or bus, many survivors related specific stories of kindness and support by local citizens, who appeared to have helped many integrate into the city. Two among these stories are:

> *Temporarily I met a real nice guy, I wish I could remember his name because he's a great human being, and he took a liking to me. Something about it, he could see I was New Orleans, and could see I was a little bit older of a guy. Anyway, he got me a little four or five day thing, working for a graphic place which is paying cash (Rene K., male, 51-years-old, Caucasian, 2005).*

> *Christine and Jerry and Joe [three individuals from Austin], they were there for me from day one. Everything I needed, they were there for me. That's my family too. There's a bad apple in every bunch, but they got some good people through those doors [in the Austin community] (Rickey B., male, 44-years-old, African American, 2005).*

Discussion

In exploring the writings' of survivors and relief workers, several patterns became apparent. Individual stories do often appear to be reflective of their gender, such as a greater concern for the care of young children, particularly young girls, by their mothers and other adult women awaiting evacuation. Though males, residing in head-of-household positions, also appeared to feel a personal responsibility and concern for the care and well-being of their "families," especially those they perceived to be in a more vulnerable position, including the sick, elderly, women, and young children. "Family" here is a term used loosely, as many of the writings reflected a change in the structure of the family as the disaster progressed, with many individuals assuming head-of-household positions for individuals they had not previously met, including Joe N. (male) who described the death of one of these individuals following their evacuation from the New Orleans area:

> *And we get to the first command center. And the lady's [the elderly lady from their group] on the neutral ground. (Which is the median, you call it here.) She's dead. She died, the lady with the bag [a catheter]. The lady who we kept alive*

> *for seven days. Who they [rescuers] took first! Who, if they'd have took her the day before, she might be with us today. An while we're comforting Diane, the daughter [of the elderly woman], and telling her, "She's in a better place, baby, she's not in pain anymore" (Navis 2005).*

The experiences of residents returning to cities within the Gulf Region to begin the reconstruction process, also appeared to be highly gendered; this was related in how the female friend of one writer, Rose (female), "sweet [talked] a National Guardsman into letting her into New Orleans and going to her house" following Hurricane Rita (Rose 2005). Once within the city, however, it was reported that many women felt little comfort in their return:

> *The demographics of New Orleans have changed in gender as well as race. The thousands of contractors and laborers that have arrived from across the country—in addition to National Guard, police agencies, security guards, and other workers—are overwhelmingly male. Because most schools are closed, there are few kids below 17 or their families. Women I know who have returned report feeling uncomfortable and unsafe (Flaherty 2005a).*

The writings of relief workers also appeared gendered, with many women reflecting a greater emotional connection towards survivors, compared to the writings of men who appeared to emphasize their connection to the survivors through "doing" activities. This connection by men is described in the experience of Brian B. (male), a Red Cross volunteer, writing:

> *It will be a long time before I'll forget the sense of purpose and significance I felt doing something as menial as emptying trash cans, or the satisfaction I got from guiding someone through the process of applying for assistance. People are better off than [sic] they were before we entered one anothers' lives. That's not something I can usually say after a day at the office (Brian B. 2005).*

These words contrast to those of female relief workers, including Caroleeena (mentioned previously), who related her experience talking with Alan, a hurricane survivor, at a Raleigh, North Carolina, shelter:

> *After the long tense night, my nerves were frayed and this man's story, this man's emotion (he didn't even cry . . . just teared up) set me to bawling—I mean full out, snot snorting, red nose, swollen eyes crying. I guess it was the pressure . . . Alan just patted my shoulder, waited for it to pass. (I felt like an idiot. I was supposed to be comforting him!?!) (Caroleeena 2005).*

Meg B., a nurse working at Kelly Air Force Base, relayed her emotions when she would find time to take smoking breaks with the residents of the hangar:

> *One of the patients, a sweet old man who is 80 years old named Rock who had been one of the group of smokers outside during the wee hours of the morning at 1536 the last few nights was there . . . He was overjoyed to see me and I was to see him (Brizollara 2005).*

Before her return to San Francisco, she gave them all her address and "[made] them swear to write . . . when they [got] settled" (Brizollara 2005).

A few exceptions appeared regarding the inequitable treatment of women in the months following the Hurricane Katrina disaster. Brian B. noted that he had

> *heard a few people, both bloggers and non-bloggers, make comments to the effect that the relief efforts are in vain because it will just turn the evacuees (who are all single mothers, according to these same comments) into welfare recipients. Kiss my white volunteer ass. I've been around these people for a week. And while it's possible that my shelter was non-representative, I can tell you that most of the evacuees *I* encountered were families, and MOST of them wanted jobs as much as they wanted immediate aid . . . To be sure, there were some who seemed interested only in the checks they could get from the Red Cross or FEMA (Brian B. 2005).*

Initially, some inequalities were seen in the Houston Astrodome, as the "displaced [were] marked with bright pink hospital wristbands" (Ingold 2005d), leading to some "stigmatization." Within a few days, however, it was reported that relief workers and survivors were being marked by the Red Cross to reduce the stigmatization (Ingold 2005a). Another story regarding inequitable treatment was featured on RainbowNetwork.com, a news site for GLBTQA individuals, where it was reported that a transgendered survivor, using a shower in a relief shelter's women's restroom, had been jailed for six days in Texas. The individual claimed that "she simply was trying to take a shower in the facility she felt most comfortable using" (D'Amboise 2005). Incidents of inequitable distribution of supplies were also noted to have occurred, including a second-hand account from Meg B., whose colleague told her that a

> *Red Cross volunteer told [the colleague] to be careful about distributing supplies because "some of these people are hoarding" . . . [but the colleague] had the presence of mind to tell her that these people have lost EVERYTHING they own. So what they take some supplies not immediately needed; most of it sits in a storage room undistributed anyway (Brizollara 2005).*

One republished, unverifiable account reported "widespread reports of racism and discrimination in Red Cross shelters, especially in Lafayette, Lake Charles, and Baton Rouge." With one doctor from California reporting to Red Cross volunteers that shelter administrators were abusing evacuees and they also

> *expressed contempt for the sheltered populations. Dental abscesses abounded and when several cases of small individual cases of Scope were donated, Red Cross staff was told not to distribute it because "they will drink it and get drunk" (Escobedo quoted in Risama 2005).*

As evidenced by the personal stories of relief workers and survivors themselves, if these attitudes did exist, they were most likely to have been limited to individual cases, and were not widespread throughout the communities to which Gulf Coast residents were evacuated.

In general, individuals of both genders appeared to experience similar feelings in their situations, including fear, frustration, and resentment towards the inequitable relief and lack of support by local, state, and federal organizations, including police officers, military personnel, and administrative officials. Relief workers appeared to express similar frustrations with the lack of organization, overabundance of bureaucracy and rules that restricted their ability to help, particularly within the larger relief organizations. Contrastingly, survivors of both genders generally expressed optimism, joy, and relief toward individual volunteers, relief agencies, and members of local communities where they appeared to be receiving equitable assistance in the weeks following their evacuation from the Gulf Coast region.

Conclusions

The recent disaster caused by Hurricane Katrina in the United States, and the subsequent course of events that have shaped the disaster in affected cities along the U.S. Gulf Coast have revealed a striking example of physical and social vulnerabilities in "western" cities in their worst case scenario (Rashed et al 2006). The disaster has strongly challenged, or at least showed the need for revisiting, some popular views that are frequently portrayed in the literature either in an implicit or explicit manner. For example, the idea that "inhabitants of less developed countries [are] more likely to die from hazards than those in more developed ones" Bankoff 2004, or the emphasis on development as an exclusive means to reducing risks (UNDP 2004). The Katrina disaster demonstrates that individuals in developed countries are also prone to death from natural disasters in the absence of sound preparedness plans, and other mitigation activities, including public awareness and community-based strategies, are as important to risk reduction as are development approaches. Likewise, the current focus in the analysis of disaster vulnerability, re-

sponse, and recovery appears largely to be shaped by the popular image of the suffering woman and the degree to which women are disproportionately affected by natural disasters as a result of their gendered status in society. While the purpose of this chapter is not to argue against this view, the message we have intended to deliver is that this kind of generalization, particularly in regard to traditional gender roles, may sometimes be misleading or not apply in all disaster contexts.

After reading and analyzing first- and second-hand accounts of relief workers and hurricane survivors—64 different individuals—it was apparent that perceptions are colored by gender. However, the experiences of men and women appeared more similar than not, with the majority of inequality reports appearing during the immediate rescue, response, and relief efforts of individuals awaiting evacuation in urban areas, particularly New Orleans. Once individuals had been evacuated outside of the disaster area, their writings indicated equitable and adequate relief opportunities were generally available within relief agencies for these disadvantaged groups. Initial findings demonstrate some feelings of discrimination and inequalities were apparent; however, these feelings were not found to be widespread. This suggests that, perhaps, gender equality and the needs of disadvantaged members are being adequately supported in certain contexts; individual researchers should carefully consider these contexts when advancing theories based upon existing literature.

The results also highlight the potential of new data sources such as weblogs for quick response research and how they can provide significant insights that complement and sometimes substitute traditional research methods that may not be feasible to conduct during the immediate aftermath period. By carefully utilizing weblogs and other online resources that draw on the direct experiences of individuals, multiple narratives may be quickly constructed about a disaster as these experiences are posted in real time from a potentially diverse sample size. Though arguably some data may be lost through the process of not "being there," particularly what may be obtained through direct observations, the integration of online materials, particularly weblogs, prove valuable in several research activities. These include establishing initial patterns, constructing research questions, providing additional sources of reflection, and allowing for the collection of data when time and finances may be limited or research sites inaccessible due to their size, stability, or remoteness.

Natural events will continue to occur, and "human action can either increase or reduce the vulnerability of societies" for potential disasters (Sequeira 2001). While this perspective does not offer a panacea, it is important to recognize that all individuals may be deemed vulnerable, regardless of gender. Because gender relationships shape how social vulnerabilities occur and the effects of subsequent

disasters, it is imperative that each perspective be equally incorporated. Through the use of weblogs, as well as additional online materials that directly relate the personal experiences of affected individuals, researchers may obtain time-sensitive data in a less intrusive and costly manner. With the incorporation of new methods of data collection, as well as the inclusion of dual perspectives in the literature and the development and planning processes, context dependent plans may be established to better embrace the existing relationships within a particular place. In the development of these types of activities, societies may begin to reduce the occurrences of disasters, ensure social equity, and move toward sustainable development (Sequeira 2001).

Notes

1. Where real names were not available, screen names were used.

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Surviving Catastrophe: A Study of Children in Hurricane Katrina

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Abstract

In this research, we examined children's experiences in the aftermath of Hurricane Katrina in an effort to contribute to the disaster literature on this important and seriously understudied topic. Specifically, we explored the following research questions: (1) What were the children's experiences in the disaster?; (2) What are others doing for the children to lessen their vulnerability?; and (3) What are children doing for themselves and others to reduce disaster impacts? Data were gathered through participant observation, focus groups, and interviews with parents, grandparents, daycare workers, school administrators, elementary school teachers, mental health service providers, religious leaders, and evacuee shelter coordinators in Louisiana. We found that despite the diversity of experiences and family situations, there were also many commonalities in the ways parents and others worked to safely evacuate children, enroll them in school, and reestablish routines, and the ways children formed new friendships and tried to adjust to the upheaval in their lives. Our study supports the idea that children are both vulnerable in disasters and need assistance from adults, but also that they are resilient and can find ways to effectively cope.

Keywords: children, disasters, Hurricane Katrina, qualitative methods

In the days and weeks following Hurricane Katrina's landfall, people around the world watched in horror as images of the immense devastation and human suffering were broadcast by the media. Television newscasts showed the dramatic rescue of individuals from attics and rooftops, families wading through murky floodwaters, and grief-stricken evacuees in mass shelters with no drinking water, dwindling food supplies, and no power. During this emergency period, parents, school officials, mental health professionals, politicians, and members of the media expressed widespread concern about children's reactions following exposure to such a traumatic event. Over one million children lived in the counties most directly affected by Hurricane Katrina, and approximately 300,000 school-aged children in Alabama, Louisiana, and Mississippi were displaced as a result of the storm (Hunter 2005). In many cases, these children lost their homes, toys, pets, schools, friends, and some were even separated from their immediate family for prolonged periods following the disaster.

In this research, we focus specifically on children's experiences in the aftermath of Hurricane Katrina in an effort to contribute to the disaster literature on this important and seriously understudied topic. Anderson (2005) contends that although significant progress has been made in the social science disaster research field over the past several decades, important areas of research have been understudied, including the impact of hazards and disasters on children and youth.

Knowledge regarding children and youths, Anderson (2005) argues, will provide a more complete understanding of the impact of hazards and disasters on society and will improve our ability to develop more robust theoretical models. He notes that researchers in developing countries and U.S. researchers who focus on gender see the need to extend analysis on women to include children and youth. Anderson develops the conversation about children's vulnerability by raising the concept of agency. Children have often been conceptualized as helpless victims, but they are also proactive agents, finding ways to communicate risks and take protective actions. While other scholars have also criticized the children-as-victims model (Kirschke and van Vliet 2005), Anderson presents the complexity of their experience and acknowledges that we need to look at the very real vulnerability of children, the actions of adults to reduce that vulnerability, and the ways children can do things for themselves, such as creating youth culture with music, art, and humor, and also using technology to communicate about risk.

Drawing from Anderson's (2005) call for more research on children and disasters, we utilized the following research questions for this study of children in Hurricane Katrina: (1) What were the children's experiences in the disaster?; (2) What are others doing for the children to lessen their vulnerability?; and (3) What are children doing for themselves and others to reduce disaster impacts? These re-

search questions, in particular, were used during a research trip to Grand Forks, North Dakota, and were found to be effective when talking with parents, teachers, and school administrators about children's experiences in the 1997 flood disaster (Fothergill 2005, data unpublished).

This exploratory research will help us gain insight into the experiences of children and families during extreme times. As Anderson (2005: 160) states, groups that are understudied can become the "underserved," especially in diverse and highly stratified societies such as the United States. Therefore, we hope that the findings from this research project will help to reduce the vulnerability of children and help them get the services they need in the immediate and longer-term aftermath of disaster, while also highlighting the special capacities and strengths of children.

Children and Disasters

Social science research on disasters has largely overlooked children. However, over the past two decades, children's responses to natural, technological, and human-initiated disasters have received increased scholarly attention from psychologists and psychiatrists working in this area. Consequently, the research that is available has predominantly examined children in a mental health context. In particular, researchers have found that the nature and severity of children's psychological, emotional, and behavioral responses to disaster are influenced by child characteristics, family context, and disaster characteristics (see Vogel and Vernberg 1993).

Child Characteristics

Several studies have examined how child characteristics may influence more general emotional and behavioral problems, as well as specific psychological disorders, including the prevalence of anxiety, depression, and post traumatic stress disorder (PTSD). Researchers have primarily focused on how the age and gender of children may influence their responses to extreme events, while less attention has been dedicated to other potentially important factors such as social class, race, ethnicity, religion, or nationality (although see Shannon et al. 1994; Stuber et al. 2005; and Vernberg et al. 1996 for notable exceptions).

Age. Most available research has focused on the consequences of disasters for school-aged children and adolescents. The results are mixed regarding whether or not younger elementary school-aged children or adolescents are more at risk for developing mental health problems after a disaster. Some research has suggested that younger children possess fewer strategies for coping with both the immediate disaster impact and its aftermath, and thus may suffer more severe emotional and psychological problems. Yet other research has shown that as children age, older

children and adolescents are more traumatized by disasters, most likely because of their understanding of the implications and meanings of the events (see Mercuri and Angelique 2004). Due to their age and the influence of peer groups, adolescents and teenagers are also at increased risk for alcohol and drug misuse after disaster (Reijneveld et al. 2005).

Very little is known or understood about the reaction of infants and very young children to traumatic events (Saylor, Swenson, and Powell 1992). Of the studies that have examined the responses of young children to disasters, the most often reported problems include clinginess, dependence, refusal to sleep alone, temper tantrums, aggressive behavior, incontinence, hyperactivity, and separation anxiety (see Norris et al. 2002). Swenson et al. (1996) found that 14 months after Hurricane Hugo, preschool children who lived through the disaster showed significantly higher anxiety and withdrawal and more behavioral problems than a comparison group of children who did not experience the hurricane. Another study of preschoolers' reactions after Hurricane Hugo found that the children expressed new and sometimes disruptive fears, but these same children often used spontaneous play, drawings, and conversation to adjust to the trauma in a relatively adaptive fashion (Saylor et al. 1992).

Gender. Research that has considered children's gender and the development of psychological and behavioral problems after disaster is inconsistent. Some studies have found no relationship between gender and the development of depressive symptoms or PTSD after disaster (Jeney-Gammon et al. 1993). Other research has found that girls express more worry (Lengua et al. 2005), anxiety and depressive disorders (Hoven et al. 2005), and PTSD symptoms (Green et al. 1991; Shannon et al. 1994) than boys, while boys seem to exhibit more behavioral problems in the aftermath of disaster (Pfefferbaum et al. 1999). Wiest, Mocellin, and Motsisi (1992) contend that children, especially girls, may be vulnerable to sexual abuse and exploitation in the aftermath of disaster.

Family Context

In addition to causing widespread loss and suffering, disasters disrupt normal daily routines and place additional burdens upon the families of children (Maida, Gordon, and Strauss 1993). Thus children are often depicted as more vulnerable in disasters because they are generally dependent on their family for their physical security and emotional support (Cutter, Boruff, and Shirley 2003), and because they do not have the same coping strategies that adults have to fight stressors. Given this, it is not surprising that increased levels of parental distress have been directly linked to children's adverse mental health outcomes following a number of disasters, including the Buffalo Creek Flood (Green et al. 1991), the Whittier

Narrows earthquake (Maida et al. 1993), Hurricane Hugo (Swenson et al. 1996), and the September 11 terrorist attacks (Stuber et al. 2005). Wasserstein and La-Greca (1998) report that high parental conflict following Hurricane Andrew was related to more PTSD symptoms among a sample of elementary school children from two-parent homes. Among high parental conflict children, Hispanic children reported more PTSD symptoms than did white children, suggesting a potentially different cultural impact of parental conflict on children's functioning following a disaster.

In their study of New York City children between the ages of 6 and 17 after September 11, Stuber et al. (2005) found several factors were associated with the prevalence of children's postdisaster behavioral problems. Specifically, living in a low-income household, living in a single-parent household, having a parent with PTSD or depression resulting from September 11, seeing a parent cry, or having a parent who was involved in the response and recovery efforts were all correlated with increased behavioral problems among children. The research team hypothesized that the behavioral issues may have been a result of the fact that low-income parents, single parents, grieving parents, or parents actively engaged in disaster response efforts may have been less available to provide emotional support to their children due to their own stress.

Although it is widely recognized that disasters often contribute to an increase in parental stress and depression, the incidence of child abuse following disasters has not been studied thoroughly (Keenan et al. 2004). In one of the first attempts to empirically examine whether or not child abuse escalates after natural disasters, Curtis, Miller, and Berry (2000) discovered statistically significant increases in child abuse reports in the first six months following Hurricane Hugo and the Loma Prieta earthquake, but found no statistically significant change in abuse rates following Hurricane Andrew. Keenan et al. (2004) examined whether there was an increase in traumatic brain injury (TBI—commonly referred to as shaken baby syndrome) among children two years old or younger after Hurricane Floyd. The results showed an increase in the rate of inflicted TBI in the most affected counties for six months following the disaster, possibly reflecting increased injury risk due to prolonged stress.

Disaster Characteristics

In a review of the literature on children's responses to disasters, Mercuri and Angelique (2004) conclude that the disaster agent is relatively insignificant in predicting children's psychological outcomes. Regardless of the type of disaster (whether natural, technological, or human-initiated), children are most likely to exhibit increased levels of PTSD when they are exposed to frightening, life-threatening

events (Hoven et al. 2005; Vernberg et al. 1996). The degree of loss experienced as a result of the disaster has been cited as another important factor in determining children's adverse reactions. For example, extreme events that cause extensive damage to children's homes and communities (Shannon et al. 1994), separation from family members (Vogel and Vernberg 1993), or the death of family members or friends (Pfefferbaum et al. 1999) have all been identified as contributing to children's negative behavioral and emotional responses in the aftermath of disasters.

Recently, researchers have begun to explore the potential impacts of pervasive media exposure of disaster on children. Saylor et al. (2003) discovered that older elementary school students and boys witnessed more media coverage of the September 11 terrorist attacks. Regardless of whether the media images were positive (e.g., heroic efforts) or negative (e.g., images of death, injury, and physical destruction), greater amounts of exposure corresponded with more PTSD symptoms, particularly when the images were viewed on the Internet (also see Lengua et al. 2005). A study of middle and high school students following the 1995 Oklahoma City bombing found that viewing bomb-related television coverage correlated with posttraumatic stress symptoms (Pfefferbaum et al. 1999). These studies provide evidence that children need not be directly exposed to a disaster to be psychologically affected by it, thus raising concern about the health and well being of children who witness images of disasters through televised, print, and electronic means.

Important gains in understanding children's psychological, emotional, and behavioral responses to disaster have obviously been made. Yet the impact of disasters on children's social worlds, including their individual lives, family and peer relationships, and schooling, is lacking. By modeling our research questions after Anderson's (2005) three types of outcomes—what disasters do to children, what is done on their behalf, and what they do themselves—we hope to discover and understand more about children's lived experiences in the immediate postimpact period of a disaster and to contribute to the accumulation of sociological research on this topic.

Research Methods and Sample

In this study we used a combination of ethnographic methods, including informal interviews, in-depth formal interviews, focus groups, and participant observation. In October of 2005, we interviewed a total of 38 individuals in Baton Rouge, Lafayette, Metairie, New Iberia, and New Orleans, Louisiana. We talked to parents (mothers and fathers from single-parent and two-parent families), grandparents, daycare service providers, school administrators, elementary school teachers, mental health service providers, religious leaders, and evacuee shelter coordina-

tors. Our sample was diverse in terms of age, race, social class, gender, professional status, and marital status. The interviews lasted between 30 minutes and two hours, and were conducted in homes, schools, daycare centers, disaster shelters, and churches.

In each interview, we attempted to learn as much as possible about children's experiences both during and following the hurricane from the adults in their lives.[1] We spoke with the parents of infants, young children, school-aged children, adolescents, and teenagers. We also interviewed professionals who were working with preschool aged children, elementary school aged children, adolescents, and teenagers. We have given pseudonyms to all individuals and schools to keep their identities confidential.

In addition to the interviews we conducted, we were also able to gather observational data at a daycare center and at two schools—the Bayou Schoolhouse, which was formed by two teachers and a group of parents following Hurricane Katrina, and at a private Catholic School on the outskirts of New Orleans that had just reopened in early October of 2005. We observed shelter operations at the Cajundome in Lafayette (a large "mass shelter," which at one time housed almost 10,000 evacuees from Hurricane Katrina and Hurricane Rita) and at a much smaller shelter at a Baptist Church in Baton Rouge. We also visited the Goodwill food and clothing distribution center for hurricane evacuees in Lafayette. In addition, we spent one afternoon surveying the flood and hurricane damage in New Orleans. We also observed a newly established Federal Emergency Management Agency (FEMA) "Trailer City" on the outskirts of Lafayette. All observations were recorded using standard field note techniques (Atkinson 1992).

Access

We gained access to our initial sample population through a variety of personal and professional connections. Fothergill's sister used to live in New Orleans, so she provided Fothergill with a list of friends who have children and evacuated as a result of the storm. A sociology professor at the University of Louisiana-Lafayette helped us gain access to the Cajundome by providing the name of a staff member whom she had recently met. She also gave us the names of daycare service providers and school administrators in Lafayette. Another colleague gave us the name of an interfaith leader in Baton Rouge. In addition to our initial contacts, we also secured interviews through a referral snowball sampling technique (Biernacki and Waldorf 1981). The use of snowball sampling helped to ensure sample diversity and to enrich the depth of our data.

Findings

The findings from our qualitative, exploratory research project on children in Hurricane Katrina are detailed in the following sections: Type I Outcomes: Impacts on Children; Type II Outcomes: Actions Taken by Others; and Type III Outcomes: Children's Actions. The Type I, II, and III Outcomes terminology for these section headings is borrowed from Anderson (2005).

Type I Outcomes: Impacts on Children

As Anderson (2005) states, the first area to examine is children's vulnerability and the impacts on children in a disaster because of their age. In other words, he calls for more understanding of what disasters *do* to children and youths and, by extension, what their experiences are in all facets of their lives. In an examination of Type I Outcomes, we look specifically at what happened to children in Hurricane Katrina in terms of evacuation, education, health, and short-term recovery.

Evacuation. For the children and families who had spent most of their lives in Louisiana, living with hurricanes was nothing new. It was simply one aspect of everyday life and, indeed, following the active hurricane seasons of 2003 and 2004, some of the families had evacuated numerous times. Yet Hurricane Katrina came as a surprise. In fact, in the days leading up to the storm, several of the families indicated that they had not planned to evacuate, somewhat an indication of their "hurricane fatigue." But as the storm switched directions and headed toward New Orleans, parents, friends, relatives, and neighbors began calling one another. Almost all of the parents we spoke to stated that it was because of their children and their concerns for their safety that they decided to leave their homes and evacuate. Several remarked that they definitely would have stayed in the city if they did not have children. The timing of the storm's approach and the evacuation decision is important. Since these fell on a weekend, children were not in school and daycare, so all of the children in our study were with family members when the situation became serious. None of the children were in self-care, which would have posed a more risky situation for them (Phillips and Hewett 2005).

The children's experiences with the evacuation from New Orleans varied greatly. Some families who had the resources drove out of town and were able to stay at hotels, friends' houses, or with relatives. Several parents expressed that, for their young children, the evacuation to a grandparent's or to another relative's house was similar to a vacation, and the children did not understand any of the larger issues the family faced. Shashi, an Indian-American woman, for example, said that her young children were happy staying with their grandparents and getting so much attention from them and their aunts and uncles. Two other women, Kate and Beth, who evacuated together with their young children, ex-

pressed that in the beginning it was fun and like a vacation; hence, they all called it their "hurrication."

However, other parents told us of frightening and stressful evacuations with their children. One mother, Debra, worked on the janitorial staff at a hospital in New Orleans and was encouraged by her superiors to bring her family members to the hospital to be safe from the storm. As weather conditions worsened, the hospital lost power and ran out of supplies and Debra, who had to work, at several times was panic-stricken when she could not find her 9-year-old daughter in the pitch-black hospital halls. Eventually, they were rescued by boat and taken to a shelter, but both mother and child appeared traumatized by the experience. Another mother, Sherron, who was staying at the Cajundome, recounted how in order to save her four children she had to steal a truck and drive out of New Orleans. Deirdre, a mother at a Baptist Church shelter in Baton Rouge, explained how she had to tie her one-year-old daughter to her body with a blanket in order to evacuate during the height of the storm. Michelle, a public health service worker, told us perhaps one of the most difficult stories from our research. A young mother was being lifted off a roof in a helicopter basket with her young baby, and due to the high winds and the movement of the basket, her baby fell into the raging floodwaters below. Michelle said that when the mother came to the morgue to look for her baby weeks later, she was very calm and exhibiting symptoms of shock. The baby's body was not at the morgue.

Most of the parents, like their children, thought that they would only be gone from home for a few days as they had in the past. Thus, the voluntary evacuees we spoke with had only taken a few personal items and two or three days' worth of clothes. Many did not gather up important documents or the most special things—such as photo albums, cherished toys, school awards, and so forth—as they were so used to evacuating and returning that this time they just did not worry about it. Past research has shown how important these personal items are to families for their emotional recovery (Fothergill 2004), and thus it was not surprising that some of the individuals we interviewed expressed great sadness over this loss.

Education. After evacuating and relocating outside of the Gulf Coast area, most young children and teenagers began to attend new daycares, preschools, elementary schools, middle schools, high schools, and colleges. Having their children settled into a good educational setting appeared to be a top priority for almost all of the parents. The children had a wide range of experiences as they adjusted to their new school settings. Some of the issues were related to the racial, ethnic, and religious makeup of the new school, the overall quality of the school, how it differed from their old school, and whether they had friends or even familiar faces at their new school. The schools themselves struggled to deal with a wide range

of emotional, behavioral, and cultural issues as they welcomed the evacuees into their classrooms or reopened their own doors, as well as with financial challenges, such as unpaid tuition.

Often children found themselves attending schools with a different demographic composition than the one they had attended before the hurricane. Shashi, for example, found that her child was the only child of color in her new preschool in Lafayette, whereas in New Orleans, children were of numerous racial and ethnic backgrounds and it had not been an issue. She stated:

> *[The school here is] very, very nice, but Charu's preschool as well as her Montessori in New Orleans was extremely different. And you can tell there's a big difference from day one, because it's extremely, extremely white . . . I could see that for the first couple of weeks she must have felt a little different there, being the only ethnic child in her class. It's not easy. And in New Orleans, even though she was the only Indian girl in her class, there were Chinese kids, black kids, you know? And white kids and even among the whites, there were Finnish kids, French kids. So there are a lot of different things.*

Other parents also expressed concerns that their children were in school settings with fewer racial and ethnic minorities during evacuation.

Anne, a mother of a 2-year-old son, missed the warmth of the teachers at her New Orleans preschool. She felt that while the new school tried to be understanding of what the evacuee children were going through, it seemed as if they were more concerned about maintaining control in the classroom. Anne did acknowledge, however, that "anytime you switch schools for any reason . . . it's really hard." In addition, we heard of several preschools in Lafayette that required curbside dropoff of children, where teachers met students right at their cars rather than allowing the parents to come into the school. For New Orleans families, that was a difficult and somewhat impersonal way to interact with the school.

Adjustment to new schools was often affected by the absence or presence of the children's old schoolmates or other peers from home. Although a few of New Orleans's schools reopened in early 2006, many children did not return to their schools because they evacuated to other parts of the country when their homes flooded, because their parents lost their jobs, or because their old schools remained closed. Thus, for the children who returned, they not only had to deal with the disruption in their families and their own loss, they also had to come to terms with the loss of their friends and classmates.

Children starting new schools had to form new friendships. This was particularly difficult for children if their temporary housing situation continued to change and they moved from school to school. One mother said that her daughter, who is in high school, had changed schools four times since the hurricane. Teenagers' dating relationships with their peers also faced challenges with the uncertainty. One teenager, Peter, had just begun to form a romantic relationship with a longtime friend, Theresa, when the storm hit and her family evacuated to the West Coast. He started a new school outside of New Orleans where he became interested in a new girl, but was not sure ethically what to do. It was uncertain if his old girlfriend and her family would ever return or if their old school would reopen. While it may seem trivial in light of other challenges, this type of anxiety weighed heavily on Peter, and he confided in his mother that he was upset by the situation.

Some of the schools were faced with emotional and behavioral issues as children struggled to cope with the anxiety from the disaster. One kindergarten teacher, Nancy Murphy, said that in all of her 20 years in the classroom, she has never witnessed children more upset than after Hurricane Katrina. She said that one of the evacuee students "had a total meltdown" at school and had spent most of the morning crying. Although Nancy tried to help the child, he was beyond consolation. Two daycare workers, Beverly and April, noted that young children were experiencing some problems following the storm. Both women agreed that "everything has changed" in the aftermath of Hurricane Katrina. In the days immediately following the hurricane, children who had previously been well behaved were acting out and causing problems. Beverly attributed these behavioral issues first and foremost to the disruption of the children's lives: many of their parents were away from home helping with the disaster relief effort, while others had moved several times since the disaster. After about a week, the children in daycare began to settle back down.

The schools also faced many challenges about how to best serve old and new students. Mrs. Murphy said she had sent a note to one little girl's family asking if they would like to participate in the class snack calendar, where each child is assigned a day to bring a treat to share with the class. The child's parents responded that they were financially unable to participate. For the children attending private elementary schools, where the tuition can run into the thousands of dollars each semester, the economic struggles were particularly acute for parents. At the Catholic school we visited, the principal, Sharlene Alarie, indicated that they were not asking parents to pay tuition, but that the policy would have to end sometime early in 2006, as the school obviously has large operating costs. She worried about what would happen when the time came to require tuition again. Another issue was the politics of placing exceptional high school athletes in temporary schools during evacuation. While school placement was supposed to be decided by the student's

temporary housing location, there were rumors that coaches were fighting over the best athletes, and at times tuition at private schools was mysteriously waived for the most talented. These rumors placed some students in the middle between many upset parents and school administrators.

Despite issues with readjustment, some of the new schools were an improvement for the evacuated children for a variety of reasons. Karla, a white mother from Metairie, for example, found that her teenage son's confidence increased during the evacuation. Her son attended a smaller school during the year after the hurricane; his New Orleans school had 1,500 students, while his new high school had just 600. He also attended a different school from his brother, who was an academic star. She explained his experience at this smaller school:

> *He came home one day and—he's not an honors student, he's a very good student, but it doesn't come easy, he works hard for his grades—he came home one day and said "I think I'm very smart." I said, "What do you mean?" He's like, "I was the only one who knew what they were doin' in biology." This school, this situation, I think, is good. [Why?] I think it's the fact that he is now* someone. *He's the new student . . . So I think he feels special in some way.*

Others felt that the schools during evacuation were actually of better quality than their old schools. Luke, a single father, remarked that his 7-year-old son, Zachary, was attending an excellent school during evacuation, and that his son was learning more than at his old school.

Health. Health concerns were plenty in the hurricane aftermath. First and foremost, because of their size and stature, children were vulnerable to injury and death during the storm and flooding. However, reports of the missing and deceased from the Louisiana Department of Health and Hospitals (2006) indicate that the elderly were by far those most likely to die in the storm. Months after Katrina, concerns have shifted to issues with toxic contaminants and poor environmental quality at homes, schools, and playgrounds. Other health concerns for children are the ability to cope, process, and recover from the trauma and disruption; we found that children exhibited a range of emotional, behavioral, and mental health difficulties.

Once the reality set in that the families would not be returning to New Orleans any time in the near future, children began expressing more uncertainty and asking more questions about the future. There were many emotional issues for the children, including fear, disbelief, and sadness. Several people, including parents and professionals, felt that the older the child, the more the anxiety because of their awareness of the magnitude of the storm, while very young children were often

seemingly completely unaware or unaffected by the degree of familial upheaval and community stress. However, there was certainly evidence that very young children did have some difficulties. According to one teacher, the youngest children would cry, use baby talk, and have potty training problems. Several parents of young children told us that their children did not want to leave them, even for short periods of time, and that in general, "clinginess" was a problem.

Children of all ages were dealing with the enormous stress and anxiety of living in shelters and not knowing if they would have a place to live when the shelters closed. Angela, a white mental health counselor at the Cajundome, recalled an interaction with a boy whose family lost everything:

> *There was this one boy who got really close to the staff; he was sort of always hanging around us, probably age nine or so. He seemed to be really angry . . . So I was talking with him and I just said, "Oh, hey, buddy, what're you doin'?" He was like, "Can you give me some water?" And I said, "Sure." So I went to the staff room, grabbed a bottle of water, came back out and gave it to him. At a certain point, he—and I never, I did not ever feel threatened—but he took the bottle of water and put it over his head like this, like he was gonna hit me with that bottle. He held it over his head and he said, "If I hit you in the head, I will go to jail, right?" And I said, "Well, I don't know. But you're really angry and you feel like hittin' me in the head?" Trying to give voice to his feelings, but he kind of just put it down and he said, "If I was in jail I'd never have to worry about where I'm sleeping."*

Angela was clearly upset by the depth of his anxiety as she recalled the interaction. Parents also had a hard time with their stress at the shelters; on one occasion we observed a young mother at the Cajundome hit her young child on the head several times as he sat crying in his stroller.

Children with any loss of life in their family were in a fragile state. In one school, we spent time with a young girl whose 2-year-old cousin died during evacuation; she had a "tummy ache" every day and instead of going to class, she came and sat with the school counselor. One eighth grader told us matter-of-factly that her grandmother, who died of natural causes during the hurricane, was in the girl's home "on ice" until the cemetery in New Orleans was reopened. She seemed to want to discuss this situation with anyone who would listen.

According to April, a daycare center assistant director, many children's anxieties and worries were largely a result of watching too much television coverage of the disaster. Some parents spoke to us of their efforts to hide media images from their children and to only turn on the television after they had gone to bed. Shashi also

felt that, in addition to avoiding television, it helped her children to evacuate out of state for several weeks so that her children were completely insulated from the trauma, and they were not constantly talking about the disaster in stores or at the playground.

Children also exhibited signs of depression. For instance, in a followup telephone conversation six months after Katrina with one participant, Debra, an African American single mother, revealed that her 9-year-old daughter, Cierra, seemed depressed and was losing her outgoing nature. When Debra put all of Cierra's pre-hurricane medals and certificates on the wall of her FEMA trailer to motivate her, Cierra insisted she take them down and get rid of them; at that point, Debra felt she needed to find a therapist for her daughter. Her concern was that Cierra would bury the stress and it would come out later. When we met Cierra in October, she was an exceptionally bright and bubbly child, who boasted that she got all A's and B's in school, and she proudly sang a song into our tape recorder. This also points to the importance of examining both short- and long-term effects of disaster on children.

For families who returned to New Orleans and for those contemplating their return in the near future, there were concerns about the environmental health risks to their children. The area from New Orleans to Baton Rouge is often called "Cancer Alley" because of the severe health risks from numerous chemical plants and refineries (see Roberts and Toffolon-Weiss 2001). Thus, even prior to the storm, children in Louisiana were living with various health risks. Many of the parents in our study spoke of deciding not to return because of the likely presence of increased contaminants in the soil and water. A few who had the financial resources planned to take specific actions, such as making their entire back yard into a slate patio upon their return so their young children would not dig in the dirt. Recent research supports the idea that the children of New Orleans will be at risk for many years and the Environmental Protection Agency (EPA) confirmed that there are chemicals in the soil sediments (Bullard 2006; Pastor et al. 2006).

Short-Term Recovery. The short-term recovery stage, typically the one year period following a disaster, historically has implied putting individual lives and a disaster-stricken community back together (Mileti 1999). Yet recovery, as past scholars have noted, is difficult to measure. In our study, the data support the idea that the early phases of recovery for children are based on many complex factors. However, there is evidence that the establishment of a predictable, consistent routine, and the return to a steady educational setting is an enormous part of recovery for children (also see Heft 1993; Maida et al. 1993). Having children settled both into a routine and back into school assisted the overall household recovery, as

parents could then, and only then, focus on other important issues such as home repairs or finding secure employment.

Recovery was hampered by the lack of contact with, and subsequent support from, friends and family. Children had to cope with being separated from family members and friends who had been a large part of their lives before the disaster. Many children were used to having extended family nearby for emotional and financial support. In the hurricane aftermath, families were scattered in shelters and temporary homes across the country. Karen, for instance, an African American mother staying in a Baptist Church shelter in Baton Rouge, spoke of how her 4-year-old son, Tyler, needed his old life and his extended family:

> *With my son, and him bein' four, it's hard to explain to him, or get him to understand, that you're not going to be where you were before. You're not goin' back to your old school. You're not goin' back to your old house. So now you have to deal with the fact that every day you have to tell him the same thing over and over. And he's sayin' the same thing: "When am I goin' back to my school? When am I goin' back home?" Or, "I'm ready to go back home. Call my sister. Call my brother. Where's my aunt?"*

In addition to missing family members, children also missed their friends. Jack, who was only five years old, showed an uncanny awareness of this situation. He told his mom that the thing he thought would be the most different after Hurricane Katrina was that "some of his friends wouldn't be able to come back because their parents lost their jobs and their homes got destroyed."

Recovery was also affected by the degree of loss incurred by the family and the family's financial situation. Parents noted that even if the first floors of their houses were destroyed, they were able to reassure their children that their bedrooms, stuffed animals, toys, and clothes were safe on the second floor. Yet, many of the children's parents were struggling financially. Some of these adults had lost their jobs, homes, and most, if not all, of their material possessions. By extension, the children were now suffering from economic hardship as well, which was of course also affecting their day-to-day lives.

Recovery for children also depended on the overall support they were receiving, the quality of the relationships in their lives, and the stability of their family and their previous lives. Christie, an African American married mother of three who was staying at a shelter in Baton Rouge, explained that her 5-year-old son blossomed at the shelter during their evacuation:

He's actually done wonderful changes up here, I'm tellin' you . . . He's went to higher heights. He's just on another level now . . . We went back to the dentist about two weeks ago. The dentist, she was like, "Is that the same little boy that's been comin' in here all the time?" "Yes, he is. I don't know who he is, either, but yes he is." He's using bigger words, larger words. I mean, he's just blossoming, educationally-wise, mentally-wise. [What do you think it was?] I would say it was the school, but it started before the school. And the school is really helpin' him. The intelligence level of the people that go to this church, that come through here, it's amazing. I mean, I don't know if it was gettin' out of New Orleans.

Type II Outcomes: Actions Taken by Others

Children are vulnerable in disaster situations, and often others, usually the adults in their lives, such as parents or grandparents, and also teachers, public officials, and even peers, take steps to lessen that vulnerability. While Anderson (2005) discussed Type II Outcomes as the work of government and its agencies (such as FEMA) or of nonprofit organizations (such as the Red Cross), we expand this idea and in this section we examine the actions of parents and other primary caregivers, shelter workers, teachers, counselors, and school administrators, and other children.

Parents and Primary Caregivers. Parents and other adults with the primary responsibility for children took numerous actions to protect and support their children. First, as mentioned earlier, they made sure that their children were safe during the evacuation process and got them settled into a temporary living situation. After that, many parents worked to reestablish everyday routines for their children. Many of the parents agreed that one of the most difficult issues for their families following Hurricane Katrina was how they had to live in a constant state of flux and uncertainty. Thus, one of the first priorities for the parents was to reestablish as much normalcy and sense of routine as possible. Routines included things such as getting children back in school, playing games, doing homework, having dinner together, and sleeping on a regular schedule. At the Cajundome, we observed how parents had neatly made their children's temporary shelter beds and carefully placed stuffed animals on pillows to make things feel "normal" or like home.

This responsibility of reestablishing normalcy was all consuming and often more difficult for single parents. In New Orleans before Katrina, over half of all families had female heads of household, and nearly two in every five female-headed families lived in poverty in 2004 (Gault et al. 2005). One mother, Tina, a white woman in her thirties, separated from her 3-year-old son's father several months before the storm. While he helped a little with parenting over the summer, when the storm

hit, he evacuated to Los Angeles and decided to stay there permanently. Suddenly, overnight, Tina became a single parent and struggled to protect and provide for her child. Unfortunately, FEMA paid the same amount for each household, regardless of the number of children, so her ex-partner received the same $2,000 that she did. Her child factored heavily in her decision making and ultimately she decided to relocate to a town in Georgia that she felt would be a good place for her son. Other parents also struggled to support their children as the sole parent, not just financially, but also in providing comfort and emotional stability.

Taking care of children during evacuation and relocation was further complicated when there were two parents, but who were separated, divorced, or not living together and sharing custody. Several parents in our study spoke about this difficult situation, as they evacuated to different places and had to determine who their children would stay with and for how long and under what circumstances. One father, Luke, explained the complex and tiring schedule that he and his ex-partner had made to take care of their 7-year-old son Zachary. Every three days Luke would drive five hours from New Orleans to Houston to take care of him and allow his son's mother to then take care of her work and housing needs. While they both were placing their son's needs first, the situation caused a lot of tension for their family. Several other parents also spoke of the difficulty of negotiating shared custody during evacuation and relocation. Since Hurricane Katrina, child custody cases have soared, new problems have arisen as parents have relocated with children far from the other parent, and courts are struggling to make custody decisions under these unprecedented circumstances (Clemetson 2006).

In some cases, families with teenagers left them behind in other towns with relatives or friends while parents returned to New Orleans for jobs or repairing the family home. This way the teens could stay enrolled in their new, temporary school. Parents did this in the best interest of their children, but it was a trying experience for both the adults and the youths. One mother, Karla, thought this arrangement was too hard on families. She had suffered the death of two children many years ago, and she felt that the best thing that parents could do was to keep the immediate family together at all times during the ordeal.

As previously mentioned, some parents were concerned about environmental contamination in New Orleans, and thus refused to return until they could ensure their children's physical safety. Kate, a white mother in her thirties, noted that she did not trust the EPA's information on health risks to children following Katrina. Instead, she researched the situation herself before returning with her two children. She first called her pediatrician, who told her not to worry about the mold, but because she still felt uncertain, she searched the Internet and tried to find reports on the environmental conditions in New Orleans. She said: "We're desperate

to go back. I'm ready to be at home. But not at their expense." Deirdre, an African American single mother, expressed similar feelings: "Because of the contamination, it's not safe for my child, for my daughter. Maybe in a year's time, maybe two years. Right now, I'm not goin' back in that city for nothin'."

Sometimes, however, it was hard for parents to be able to help their children because they, the parents, were still suffering and coping and unable to see what they needed to do for them. Reverend Kimberly Morris, an African American minister and community leader who worked with families who evacuated to Baton Rouge, explained how parents often needed some guidance on how to help their own children, some of whom had seen dead bodies and feared for their own lives. Often, she said, she just needed to encourage parents to "pay attention" to the children. In one case, a mother decided not to talk to her 5-year-old daughter about the father's suicide during the disaster because she was not in an emotional place where she could help her daughter grieve. Reverend Morris, however, felt that the young girl already knew about her father and needed to talk about his death. In addition to helping parents devote attention to their children, Reverend Morris also wanted to make sure that parents felt they had some control over their family life. For example, evacuated families were encouraged to enroll their children in Baton Rouge schools, but if parents decided not to because they thought it would be too hard on their children, then the shelter directors and religious leaders did not force them; as Reverend Morris stated: "We are not here to inflict more pain; we want the parents to make these decisions for their children."

Shelter Workers. In addition to parents, we found that shelter workers and local volunteers were crucial in helping children who lived for long periods in shelters with their families. One shelter in Lafayette set up a drop off play area, where parents could leave their children for an hour or two while they worked on finding housing or assistance, took a shower or nap, or just took some needed down time. In this particular case, children had to be potty trained to stay at the child drop off area, so parents with the youngest children—often the ones that needed the break the most—were unable to use that service. Shelter workers also tried to set up book areas and other activity centers in the shelter. We witnessed one shelter volunteer, for example, playing a game of chess with a young boy. Several local businesses and large corporations, such as Wal-Mart and Toys-R-Us, donated toys and games for the children. In this particular shelter, they threw away any used donations because they felt that the children deserved new items. One volunteer, Laurel, had started a basketball clinic for girls and boys after school at the shelter. On one of the days we observed shelter activities, we accompanied Laurel as she made her rounds, encouraging any child she saw to head out to the basketball court to join in the game. At a smaller shelter in Baton Rouge, a local yoga instructor offered free

yoga lessons to the children, and the shelter organized community volunteers to take the children on several outings, including a day of roller skating.

At the Cajundome, shelter workers tried to make some exceptions for children who needed extra care. While babies could not be dropped off at the children's area, shelter workers tried to reserve the shelter "suites" for mothers with newborn babies or children with other special needs. Renee, one of the directors of the shelter, explained how one young girl with Down Syndrome could not handle the noise and chaos of the shelter and was screaming and scared. The shelter workers made sure that her family got one of the few suites. In addition, shelter workers tried to keep children safe and discouraged parents from leaving children alone while they were napping or offered to watch their napping babies so the parent could attend to other children.

Unfortunately, among the hundreds of shelter volunteers from around the country, some lacked the skills to help children in the most effective ways. In one situation we observed, for example, a young African American girl had skinned her knee playing basketball, was crying, and had come to find a band aid. First she approached the mental health table, and the white mental health workers, annoyed to be mistaken for a nurse and missing an opportunity to talk to an upset child, told her she was in the wrong place and waved her over to the nurses' station. Subsequently, the white nurse approached the little girl and scolded her, saying "Have you been out there playing basketball with the boys again?" While the nurse may have been trying to be lighthearted with that comment, we could tell by the girl's facial expression that she heard the reprimand, not the humor. In addition, there were various race, class, and regional issues at play in the shelter settings. Regional language may have been an issue, as an 11-year-old expressed that she did not like the shelter because there were "beaucoup people" and the volunteer shelter counselor from another region of the country had never heard the term before, yet in this case was able to understand that the young girl felt it was too crowded in the shelter. Other issues may be bigger. Frank, a licensed clinical social worker, described some meetings regarding children's behavior:

> *Most of the referrals I got were young African Americans. Both girls and boys, but predominantly African Americans. With some of the differences, the white children tended to have parents that were more involved and would come in to meetings and were more . . . [pause] How do I want to say this? I don't know, just more agreeable, more willing to change. This is a big thing in the South, still, the racial divide. If you have an African American child who's in there with a parent and all the staff members are white, or most of 'em are white, you know, it creates a problem. If you don't address those things, that can be a problem, too. We're working on that down here. But that's always a big deal. You can say it shouldn't*

> *be and that this is 2005, but it's still a problem. Anyway, the parents we had of some of the African American kids, a lot of 'em, maybe they were working and they couldn't get off or they'd get fired. Sometimes you'd call 'em and they'd say they'd come and they wouldn't come. Sometimes they'd come and just argue, argumentative, they just didn't want to cooperate or be open to new ideas.*

This situation touches on the many serious race issues that exist in this nation during nondisaster times, and it illustrates the fragile dynamics of volunteers, professionals, and parents working to help children in disaster times. Past research on disasters has documented the problems and challenges of having solely white aid workers and predominantly people of color survivors using the disaster assistance (see Beady and Bolin 1986; Fothergill, Maestas, and Darlington 1999; Katayama 1992; Phillips and Ephraim 1992), although more attention needs to be dedicated to this serious issue.

Overall, however, we observed many positive interactions between shelter workers and families in both the large shelter in Lafayette, and the smaller Baptist Church shelter in Baton Rouge. Indeed, when one mother and daughter were overjoyed to hear that they had been offered a FEMA trailer to live in for 18 months, they came running to share the news and to hug the shelter worker who had helped them find the housing. Another Katrina survivor expressed her gratitude for the volunteers and shelter workers, and she remarked that they treated the evacuees like "kings and queens." Of course there were issues and times of stress, but it did seem that many of the evacuees and shelter workers developed strong bonds following Hurricane Katrina, and many of these were across class and race lines.

Teachers, Counselors, and School Administrators. Adults in the school setting were crucial in assisting children in the disaster aftermath. Principals, teachers, school counselors, and social workers often worked overtime to help children who were affected by Hurricane Katrina and to think of ways to lessen the impacts of the disaster.

In one situation, in an effort to recreate a familiar environment for their children, two teachers and a small group of parents from a New Orleans elementary school formed a new school during evacuation. They felt that establishing a new, temporary school with about 20 children from their old school would help their children deal with the upheaval caused by the disaster. The school, Bayou Schoolhouse, named by the children, was located in the back of an accounting office in a small town two hours west of New Orleans. The children could have attended local public schools, but the parents chose the new school, partly because one of the teachers, Mr. Fontenot, was willing to teach for free and was supportive of the idea of the temporary school. In addition, the parents wanted to keep their kids together,

rather than putting them in unfamiliar schools. The children took daily field trips to the bayou, the public library, and to the sugar cane fields in the surrounding areas. The school also arranged for special guests, such as a local singer who came to perform for the children the day we were there observing the students and teachers.

Reestablishing routine was also a central concern for teachers and school administrators. After the initial novelty of the "extended vacation" wore off, the children actually seemed to want a routine. One girl, Allie, thought "school work was too easy" now, and she told us she wanted her old math book back. One school principal, Mrs. Alarie, met with all of her staff two days prior to the school reopening (it was one of the first schools on the outskirts of New Orleans to reopen following the disaster) and began by emphasizing how important it was that they do everything they could to support the children during this time of immense uncertainty, but also that they provide the instruction and discipline that is expected and necessary in any school. She emphasized to her staff that *all* children were affected by the hurricane, even those who had not lost their homes. Thus, the staff needed to be sensitive to this issue. In the days after classes resumed, Principal Alarie and her teachers worked hard to maintain rules in the classrooms, although there was some recognition that exceptions to the normal rules would have to be made. For example, when a teacher pulled a student who was not wearing the required school uniform "knee socks" aside to reprimand her, she found out that the student had lost all of her clothing in the flood, and that she no longer had the appropriate attire to wear to school.

In addition to maintaining discipline, the teachers also worked diligently to counsel students and give them support if they needed it. They tried to help "old" students accept the newly enrolled students. They also tried to help the students cope with the loss of their old friends who had not returned to school because their families had relocated to other parts of the United States. The teachers, school administrators, and school counselors were also keenly aware that the students had either lost their own homes, or that they had family members or friends staying in their homes with them. One way or the other, the children's home life and hence routine would be disrupted and perhaps even somewhat chaotic, thus making it very difficult for the students to concentrate and complete their normal assignments. Teri, an elementary school counselor, was in favor of continuing to assign homework to students because she recognized the important role that schools play in establishing routine and normalcy in children's lives. At the same time, she was also sympathetic to the situation kids were in after Hurricane Katrina, and she advocated "cutting back" some on homework, even though she felt it was still important that the students do it. She said:

> *One mother told me about her two boys getting three detentions. They get lunch detention because they don't do their homework. So they have to finish their homework after lunch. She says, "We have six of us living in three rooms upstairs, so there's no private time." I said, "I understand." But you still want them to be as normal as possible.*

Beyond rethinking out-of-class assignments, the teachers also had to be flexible because they literally did not know who would be in class from one day to the next, as some families were returning to the school, while other families were relocating to different areas. With the influx of new students, there was also a shortage of books, desks, school uniforms, and school supplies. Thus, the teachers often had to improvise to make things run as smoothly as possible. In one school where uniforms were required, teachers and parents started a uniform donation program to help displaced students or students who lost their clothes in the flood get new ones.

Schools also had to address disciplinary problems and new behavioral issues. Frank, a social worker and Red Cross volunteer, indicated that adolescents and teenagers who had been displaced by the storm, particularly boys, were exhibiting some behavioral issues. He was hired by one school district to deal with children who were acting out in the classroom, such as talking back to teachers or getting into fights with other students. One school counselor was very clear that in her school, the older the child, the harder the experience, as mentioned earlier. It is important to note that not all children were seemingly suffering from emotional problems. One fifth-grade teacher told us that some kids did not seem at all upset by the hurricane.[2]

Children. In addition to all of the actions taken by various adults, there were also many children and adolescents outside of the hurricane zone who found ways to help those youths who evacuated. One example was in the Baptist Church shelter in Baton Rouge. Christie, an African American mother in her thirties described her 5-year-old's birthday party held at the shelter. It was organized by the teenagers from the church congregation, and they worked hard to decorate the shelter and to devise songs and games for the young boy, Charlie. The party included all the teenagers standing in two lines with their hands at the top creating a tunnel that Charlie walked through as they sang to him. Charlie told his mother that it was his "best birthday ever."

Students themselves said that they tried to be welcoming to displaced students. Emily, a 9-year-old in Lafayette, remarked that she and her classmates were all trying to be "extra nice" to the new students, and for the most part the new children were "just like other kids" and "you can't even tell" who they are. However, Emily

did add that two of the new children were very quiet, and one boy, when asked by his classmates why he went to see his old destroyed house in New Orleans, did not answer. In a Catholic school, they developed a system, where new students were given a "buddy" who would help them with the adjustment to their new school environment.

Type III Outcomes: Children's Actions

According to Anderson (2005), research has failed to examine the ways in which children themselves do things to reduce disaster impacts. The idea is that children are not passive in disasters; they are active observers and take actions before, during, and after that help themselves and others to cope with the disaster and subsequent disruption. We gathered data showing that children who were most directly affected by the disaster did take actions, such as communicating about the risk with both adults and other children, writing in journals and creating art, seeking out support and comfort from their friends, and helping other children recover.[3]

Communicating about the Disaster. Our research found that children communicated about risks and the subsequent hurricane disaster in a wide range of ways. Clearly, the youngest, preverbal children were less able in general to take actions to reduce their vulnerability and help themselves recover. Older children did talk about the event, although some more than others. For example, Shashi's daughter repeatedly asked her to tell stories about what happened in the hurricane, and she especially wanted her mother to talk to her about what happened to her bedroom. In a daycare center in Lafayette, the children who had lost their homes in the flood did not want to discuss their experiences. Some schools and shelters had counselors come in to have the children talk about what happened to them, but we heard on several occasions from parents and teachers that often the counseling was more problematic than helpful, in that it seemed to upset the children. Overall, it appeared to help children if they could talk, when they needed to, with someone they knew and trusted.[4]

We discovered in Louisiana that children coped with the disaster by writing in journals, creating disaster jokes and music, and drawing pictures. We observed elementary school-aged children keeping journals about their experiences. At the Bayou Schoolhouse, a new school assignment for the children was a journal writing project that enabled them to write and draw about their hurricane experiences. One teacher shared with us a copy of a journal that one of his second grade students, Heather, had been writing in following Hurricane Katrina. Each day the children were required to write at least three sentences in their journals. For Heather, almost every day in mid-September of 2005 began with the phrase "I hate hurricanes." On September 21, 2005, as Hurricane Rita was descending on

the southern United States, her entry read: "I hate hurricanes." "I hope it doesent [sic] hit Louisiana." "I wish hurricanes wold [sic] go away forever because they distroy [sic] to [sic] many things!" On September 26, 2005, she wrote: "I hate hurricanes!" and "I am glad I have food, a bed, and a house to go home to!" and drew a small picture of a house at the bottom of the page.

In addition to writing, younger students were also drawing pictures, thus expressing their thoughts and emotions through a visual medium. In the makeshift classroom of the Bayou Schoolhouse, the teacher had placed a sign on the wall that said "Words for Our Hurricane Adventure Stories." Below the sign, the students had posted their pictures and some word associations. The children drew pictures that included images of a crowded highway packed with cars and a levee with water pouring from the side. Words used to associate with these images included "grass dirty" and "disgusting water." An elementary school art teacher told us that "Kids will draw everything they normally would, but now there is flood water at the bottom of many of the pictures."

Some children invented new hurricane games. For example, two children who evacuated from New Orleans played a game they called "evacuation" in their new temporary home. In this game, they ran around their house with bags and tried to throw as many things in the bag as quickly as possible, as if they were frantically leaving their home before the hurricane. In a study of children following Hurricane Hugo, Saylor et al. (1992: 145) found that children also invented games (which they called "hurricane") where they would pretend to evacuate to their grandparents' houses or do repairs on their imaginary hurricane-damaged homes, and Gump (2006) reported that children created a game called "flood" that allowed them to reenact their families' evacuation in a flood disaster. In addition, according to a volunteer at the Cajundome, children used toy helicopters, ambulances, and other emergency rescue vehicles to reenact what they witnessed in Hurricane Katrina, a game that allowed them to help themselves process the experience.

Maintaining and Relying on Friendships. Children used their friendships as a support system throughout the crisis. By working to maintain friends, be with them, and connect with them, they were seeking ways for their friendships to provide a sense of security. In the relocation aftermath, children and youths spoke of wanting to be with their friends, to call them, to e-mail them, and, if possible, to enroll in the same schools with them. We saw this as an important aspect of their recovery and their actions to do something for themselves and others. Actively seeking this peer support and camaraderie appeared to be a self-coping mechanism.

Parents and teachers recognized that friendships were an important aspect of the children's recovery, and some schools tried to place friends in the same classroom. Luke, for example, knew it made all the difference for his son, Zachary, who got placed in a classroom in Houston with an old friend. Zachary also had two cousins who were close to his age living in Houston, which also seemed to be a tremendous help in his resettlement in a new city and new school. In addition, the children of the Bayou Schoolhouse also benefited from being with friends and former classmates from their New Orleans school. In our observations of their interactions, we could see how the familiar companionship and friendship provided them support and comfort. Months after the disaster, children were still asking to see or talk with old friends. In a followup phone call nine months after Hurricane Katrina, Karen told us that her now 5-year-old son Tyler still asks to call or visit his old friends from his destroyed neighborhood in New Orleans East. These requests demonstrate the importance of friendships and the ways that even very young children may actively seek out the support of their peers.

Helping Others. According to the National Mental Health Association (2005), in the aftermath of a disaster, adults should help children find ways to help others, no matter what age the child. It is this process of helping others deal with tragedy that can reassure and help children cope with their own anxiety and sense of loss. We found that children of all ages were engaging in a variety of helping activities following Hurricane Katrina, such as helping take care of younger children and assisting their parents with household chores.

In the shelters, there was quite a bit of evidence of the ways in which older children assisted with younger children. At the Cajundome, Angela, a mental health counselor, observed the following help done by the children:

> *Predominantly I see the girls—and really I hate to say it, but—really being stereotypical in gender roles as far as caretaking, acting like mothers, making sure baby has the appropriate clothes on so they're not too hot or not too cold, feeding the baby for mom, stuff like that. Whereas boys are . . . I notice older brothers, they appear to be siblings, I don't know if they are, but older brothers playing catch with the other kids, engaging them in some kind of active play.*

While the activities were gendered, it is clear that these older children are finding ways that they can give assistance to younger siblings or other young children at the shelter.

During the focus group at the Baptist Church shelter, the four mothers strongly agreed about the ways all of the children got along and helped with the younger

children. Karen remarked that "the older ones, they comfort the younger ones," and Christie added "they're sharing, all of 'em are sharing toward each other. They went through this situation that brought them together, and that's really important, that they're together, that they play well together. It's gonna help them to get through."

Conclusion

This research described and analyzed the experiences of children and their families in the aftermath of Hurricane Katrina, discussed what was done on behalf of children to reduce their vulnerability, and illustrated various things that children did for themselves and for others in order to lessen the impacts of the disaster. Despite the diversity of experiences and family situations, there were also many commonalities in terms of how parents and others worked to safely evacuate children, get them enrolled in school, and reestablish routines, and the ways in which children formed new friendships and tried to adjust to the upheaval in their lives.

As discussed earlier, children are vulnerable in disasters in many ways, and yet they also take various actions that protect themselves and others. Researchers have stated that looking only at children as traumatized victims is a "one dimensional categorization" that ignores their resilience and capacities (Kirschke and van Vliet 2005: 380). Our study supports the idea that children are both vulnerable in disasters and need assistance from adults, but also that they are resilient and can find ways to effectively cope (also see Jeney-Gammon et al. 1993). With that said, however, we want to stress the critical role of support agents for children. These agents include the adults and peers who help children and youth recover in the aftermath of disaster. From the homes of grandparents to the mass shelters with hundreds of people in one room, children need the support of adults and friends to cope with disasters. Indeed, these support agents are vital in helping children respond more effectively to the life stresses caused by disasters and other traumatic events (Vernberg et al. 1996). Past research on support agents finds that parents are often the single most important source of social support to elementary school-aged children following disasters (Heft 1993; Vogel and Vernberg 1993), while our research also demonstrates the different, but vitally important roles that teachers, disaster relief volunteers, shelter workers, and peers may play in the short- and long-term recovery of children affected by disasters.

Understanding children's experiences may help us to answer larger questions about disaster recovery. Anderson (2005: 165–166) asks: "To what extent does having injured children and youths restored to health, back in school, and employed contribute to household and communitywide recovery?" From this research, we believe we can begin to answer this important question and address some of the

uncertainty that exists about recovery. We believe that having children restored to health and back in school is a—if not *the*—major cornerstone of both family and community recovery. When infants, young children, and teens are taken care of, adjusting, and reestablishing routines, there is a ripple effect, whereby others can then feel that there is solidity to the family and community and that other concerns can be addressed. In New Orleans, unfortunately, community recovery is far off, as children have not returned in large numbers and most of the schools have not reopened. Furthermore, the potential harm of children from the toxic chemicals in the soils and in the damaged buildings leaves one wondering about the potential for sustainable long-term recovery there. For families who have relocated to new areas, their household recovery can often be measured by the children's adjustment—including enrolling in new schools, making new friends, and finding a consistent routine.

Policy Recommendations

Given the catastrophic damage caused by Hurricane Katrina, many important lessons must be learned, shared, and applied following this tragic event. While our findings are preliminary at this stage, there are several recommendations that are emerging from the data. First, the research points to the importance of schools for the recovery of families, children, and entire communities. Indeed, schools are central for a child's return to routine and normalcy. This is in alignment with the National Association of School Psychologists (2006), which has stated that schools will play an important role in helping young Hurricane Katrina victims cope with the disaster.

Second, along these lines, attention needs to be paid to how schools welcome and integrate their displaced children. For example, it may benefit children if schools assign displaced students in classrooms together and have programs in place so that the children's adjustment is aided. Additionally, teachers and school administrators need to be aware of diversity issues. In disasters, as in Hurricane Katrina, some children will end up attending schools with children of different racial, ethnic, class, and religious backgrounds from their previous schools. In these situations, there is significant need for cultural sensitivity on all sides and this should be facilitated by the teachers and school administrators. Schools also, if possible, should waive tuition, fees, and strict uniform requirements while students and their families are recovering.

Our research also demonstrates that in addition to family members as primary caregivers, teachers, school administrators, daycare providers, disaster relief volunteers, and shelter workers all contribute in different, but important ways to children's postdisaster emotional and social wellbeing. Thus, we recommend

that individuals who work closely with children in daycare centers, schools, and evacuee shelters receive information regarding the importance of routine, but also of being flexible, in the aftermath of disaster. These individuals obviously play a crucial role in not only helping children but, by extension, entire families, recover from disaster.

Given the level of loss and devastation caused by Hurricane Katrina, many children were forced to live for long periods of time in mass shelters with their families. Although this type of situation is certainly not ideal, we found that there were things that shelter workers did to help ease the process. For example, tutoring programs, organized play activities, and child drop off areas not only helped the children stay active, these programs also gave the parents an opportunity to rest or take care of other important responsibilities. Thus, we recommend that disaster shelter coordinators support and continue to implement these programs. At the same time, we also recommend that care programs be put in place for children of all ages, including infants and toddlers, so that parents with the youngest children also have extra assistance. In addition, we urge mental health volunteers at shelters to step outside the traditional models to talk with children and families and look for new ways to reach those victims who may not want to approach the mental health table at a shelter. As in all of the scenarios discussed, it appears that demonstrating sensitivity, flexibility, compassion, and creativity will prove to be extremely effective approaches for helping children.

Finally, we recommend a reevaluation of FEMA disaster assistance to single parents with children. Following Hurricane Katrina, a single mother with children received the same amount of FEMA aid as an adult man with no children. In New Orleans, a city with a high percentage of poor single mothers and impoverished children (U.S. Census Bureau 2004), this was a significant issue for the wellbeing of children and one that deserves attention. A "one size fits all" approach will not address the needs of the most vulnerable populations struck by disaster, and thus we must reconsider the distribution of disaster aid.

As the research progresses, additional policy and research recommendations will emerge, but it is certain at this point that more attention needs to be paid to the welfare of children in disasters if we are going to reduce their vulnerability and lessen the impacts on them in future disasters. Children and youths have both unique experiences and distinct perspectives in disasters, as well as being a link for families to the world of public education, new knowledge, and perhaps even social services. By studying children in disasters we will be gathering information that could reduce losses and trauma for families and larger communities.

Notes

1. In future work, we intend to interview children and adolescents directly about their experiences in a disaster. Given the time constraints involved with quick response research, for this project we were only able to receive approval from our universities' human subjects committees to interview adults while in the field.

2. However, this statement should be interpreted with caution, given the propensity of adults to underreport children's adverse emotional and psychological responses to disaster (see Mercuri and Angelique 2004).

3. In Anderson's (2005) section on Type III Outcomes, he focuses on the actions of adolescents, such as the formation of a youth subculture or how youths educate their parents about risk. In this study we gathered more data on young children, mainly as a result of the Louisiana public school system not allowing us to talk with teachers and counselors in the high schools. Thus, in many ways this section is shorter than the others because we have less data on teenagers. The data we have on young children, however, still points to the importance of what children do for themselves and others following a disaster.

4. Although there is no consensus regarding the best way to respond to children's emotional and mental health needs in the immediate aftermath of a disaster, many of the activities that disaster survivors report as most useful—such as providing abundant and accurate information to children, encouraging mutual support, and reestablishing daily routines—are not traditional mental health interventions (Saunders 2006).

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"Losing Everything:" Undocumented Latino Workers and Hurricane Katrina

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Abstract

Latinos are the largest minority in the United States. Historically, marked inequalities characterize the experiences of this migrant group. This research locates the experiences of a small sample of Latino workers in Hurricane Katrina within a broader context to argue that everyday structural properties or social forces inform their disaster-related practices. The findings of this research suggest several shared vulnerabilities among undocumented Latino workers, the need for more inclusive public policy, and of more research to generate a better understanding of the underlying social, political, economic, and cultural circumstances of disaster in the United States.

Keywords: Latinos, vulnerability, undocumented workers, agency, and structure

Latinos are the most rapidly growing group in the United States and, as of July 1, 2004, the largest minority group in the country, surpassing African Americans (U.S. Census 2003). According to the 2004 U.S. Census Community Survey, there are approximately 40,459,196 individuals of Hispanic or Latino origin in the United States, 14.1 percent of the total population. Moreover, demographers specializing in immigration estimate an undocumented Latino population of more than eight million (Passel 2005). However, very little research has been conducted regarding the impact and consequences of disasters on this social group. Historically, Latinos in the United States have had unequal access to symbolic forms of power

(e.g., education, media) and as members of an unequal power system are disproportionately located or grouped at one of the lowest levels of the U.S. social structure. Because a disaster presents the interaction between the vulnerability and resiliency of a population with a triggering event, it is important that we analyze and dissect those processes that structure the differentiated effects of disasters.

In the disaster community, research on the Latino population, particularly that of the vulnerability of undocumented workers in the United States, is mostly absent. This is due to a number of factors, including: the limited presence of minority researchers in the field, and the dearth of disaster research dealing with race and ethnicity (see Aguire 1988; Aguirre and Quarantelli 2005; Enarson 2001; Peacock and Girard 2000; Fothergill, Maestas, and DeRoguen Darlington 1999; Morrow 2000; Phillips 1993; Bolin and Bolton 1986; Turner et al. 1980; Lindell, Perry, and Greene 1980). More importantly, undocumented immigrants are not easily identifiable and are a difficult population to access, especially in disaster or crisis situations because of their illegal status and fear of being deported to their countries of origin. This chapter may be one of the few research efforts dealing with issues specifically related to undocumented Latino workers in disasters.

The chapter analyzes and illustrates how Latino undocumented immigrants prepared for, coped with, responded to, and began to recover from Hurricane Katrina. I explore how undocumented immigrants managed and negotiated the prevailing uncertainties related to Hurricane Katrina, and how this was compounded by their current status in the United States. The findings of my research suggest that the experience of Latinos with Hurricane Katrina, specifically undocumented immigrants, diverges from that of other groups.

Methods

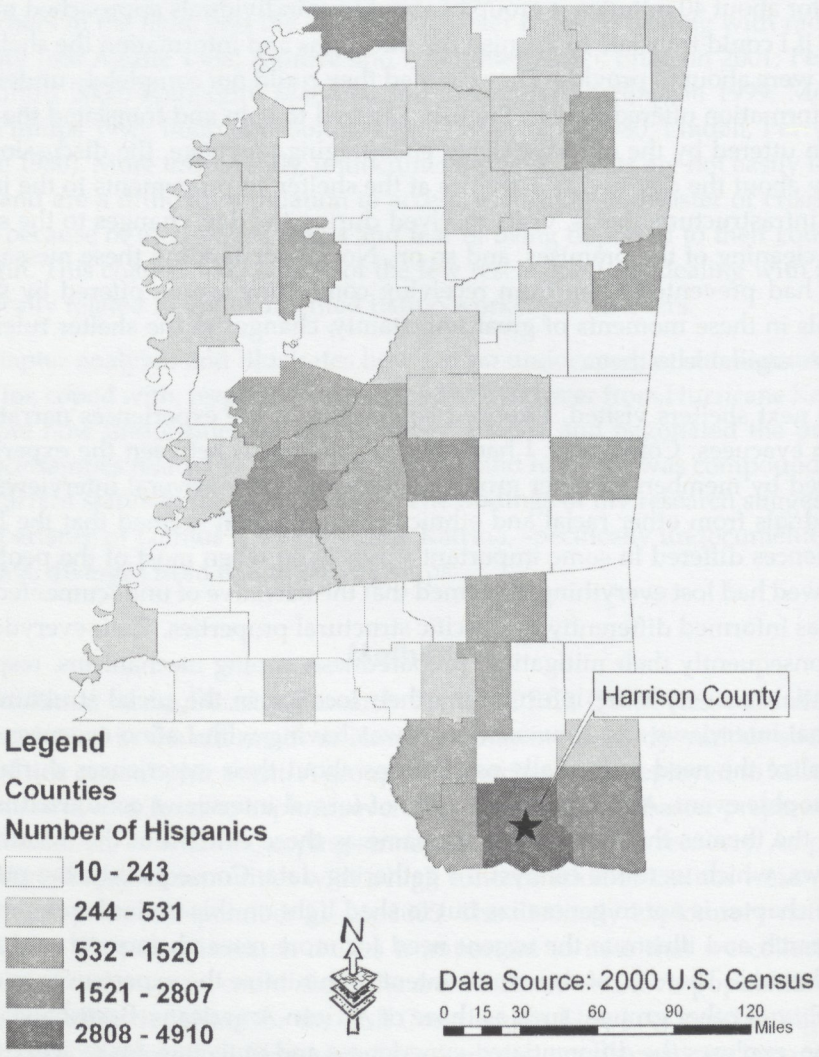
As is tradition of the Disaster Research Center (DRC), Quick Response research was conducted in the aftermath of Hurricane Katrina to study various social aspects of this catastrophic event. A group of researchers was deployed to Mississippi, Louisiana, and Texas to explore several issues related to disaster preparedness, communication, evacuation, coping strategies, response, and recovery. As part of that effort several communities with a high concentration of Latinos were visited in Mississippi from September 21–26, 2005. The distinctly exploratory nature of DRC Quick Response research makes it important to note that we collected as much information as we could about the areas affected and their population characteristics before departing for the Gulf Coast region. However, conducting interviews with Latinos and undocumented workers was not planned; for instance, the interview guide that had been developed was only in English.

Assessing the experiences of Latino immigrants was an initiative that emerged while I was in the field conducting interviews with evacuees from different racial and ethnic backgrounds. In my visits to shelters with two other fellow graduate students, Daniel Marks and William Donner, I was impressed by the number of Spanish speakers we encountered. Interested in hearing more about their experiences, in the first shelter we visited I started conducting informal interviews and having detailed conversations with self-identified Latinos. It was particularly interesting to me that, after identifying myself as a Latina student and talking with them for about 40 minutes, a group of about four individuals approached me and asked if I could translate to Spanish the directions and information the shelter officials were about to provide. They claimed they could not completely understand the information offered only in English. I agreed to help and translated the information uttered by the officials. Using encouraging language, the discussion was mostly about the day-to-day activities at the shelter, improvements to the improvised infrastructure, meals, visits received during the day, changes to the shelter rules, cleaning of the premises, and so on. Not understanding these messages in detail had prevented them from receiving comforting words offered by shelter officials in these moments of great uncertainty, changes in the shelter rules, and services available to them.

In the next shelters visited, I noticed similarities in the experiences narrated by Latino evacuees. Conversely, I had noticed differences between the experiences narrated by members of other groups. After conducting several interviews with individuals from other racial and ethnic backgrounds, it seemed that the Latino experiences differed in some important ways. Even when most of the people interviewed had lost everything, it seemed that the narrative of undocumented Latinos was informed differently by specific structural properties. Their everyday life and consequently their mitigation, preparedness, coping mechanisms, response, and intial recovery were informed by their location in the social structure. The informal interviews and conversations I was having with Latino evacuees made me realize the need to formally ask Latinos about their experiences during this catastrophic event. Although the number of formal interviews conducted is very small, the themes that emerge are the same as those evident in the informal interviews, which were the catalyst for gathering data. Consequently, the purpose of this chapter is not to generalize but to shed light on this underdeveloped area of research and illustrate the urgent need for more research focused on Latinos and disasters. There is, of course, no intent to minimize the experiences and vulnerability of other groups, such as those of African Americans. Barnshaw, in this volume, explores the differentiated experiences and outcomes for evacuees from other groups. Rather, in this chapter, I seek to reveal those previously unexplored

unique facets of the Latino experience and, more specifically, those of undocumented Latino immigrants and their interaction with the social structure of the United States.

Subsequently, with permission from the DRC, I translated the interview form into Spanish and conducted interviews in Spanish. Conducting the interviews in this



MAP 1: Mississippi – Hispanic Population in 2000

TABLE 1: Demographic Profile of Latino Evacuee Case Studies

	Alonso	Humberto	Hector	Miguel	Mario	Lorena	Diego
Ethnicity	Mexican	Honduran	Cuban	Honduran	Salvadoran	Mexican	Mexican
Area of residence prior to the event	Pass Christian	Pass Christian	Gulfport	Pass Christian	Gulfport	Gulfport	Pass Christian
Country of citizenship	Mexico	Honduras	United States	Honduras	El Salvador	Mexico but with a child born in the United States	Mexico
Time in the area	4 years	5 months	29 years	1 year and 4 months	2 years	1 year	1 week
Age	43	35	49	32	39	26	35
Gender	Male	Male	Male	Male	Male	Female	Male
Marital status	Married	Single	Divorced	Single	Married	Married	Married
Occupation	Fisherman (worked as a packager for a fishing industry)	Construction worker	Construction worker	Temporary service jobs (lawns, painting, maintenance)	Construction worker	Room keeper in a hotel	Construction worker
Education	Primary	Primary not completed	Primary	Third Year of Primary	Primary	Primary not completed	Primary not completed
Source of warning information	Employer	Coworker	Police	Van with loudspeakers circulating in the area	Employer	Latino media	Coworker
Evacuation	Stayed with coworkers	Stayed with friends	Stayed in own apartment	Stayed with friends	Stayed with friends	Stayed with a relative	Stayed with coworkers

group's first language afforded an opportunity for them to incorporate, elaborate, and fully describe their experiences and perceptions without any language barriers. In my effort to include this group in the data collected by the DRC, I completed in-depth formal interviews with seven Latino immigrants and about 30 informal interviews. While informal interviews were conducted throughout the Mississippi coast, all of the participants that completed formal interviews were residents of Harrison County prior to the disaster. According to the 2000 U.S. Census, this county has the largest Latino population in the State of Mississippi (See Map 1). The sample included five undocumented male workers, one undocumented female, and one documented immigrant worker. Very few Latino women were staying at the shelters compared to men. This was corroborated by asking the shelter personnel about the demographics of the individuals in each location. This could be because the majority of immigrants are male. Research has found an increasing migration of males to the United States. In fact, the United States is the only industrialized country in which the numbers of female immigrants have declined in the past 25 years (Fry 2006).

Because of the extensive and detailed information gathered through those in-depth interviews, each one of them was treated as a case study, providing rich data on the particular difficulties and issues confronted by these immigrant evacuees before, during, and after the impact of Hurricane Katrina. Table 1 gives a general profile of each case. Although the data for this analysis derives from a small number of cases, they provide important insight into how undocumented immigrants are impacted by catastrophic events in ways that members of other groups are not, despite a similar social structural location. The interviews, ranging in duration from 30 to 50 minutes, were recorded, transcribed, and analyzed using the Constant Comparison Method (CCM), which is at the core of qualitative data analysis and grounded theory (Boeije 2002).

The analysis of the in-depth interviews suggests that undocumented Latinos experienced several limitations and challenges as a direct result of their citizenship status, gender, language, and ethnicity. Further, the limitations experienced by this group in Hurricane Katrina were exacerbated by two specific factors, peculiar to these immigrants: recent arrival to the United States and the impact of several storms and hurricanes on their countries of origin. For example, Mexico experienced two of the most devastating storms in recent history (CRED-International Disasters Database 2005). The International Federation of Red Cross and Red Crescent Societies (2005) reported that as of October 18, 2006, the Red Cross was involved in emergency operations in eight countries in Central America and the Caribbean, providing aid to more than 10,000 devastated by Hurricane Stan. The aforementioned factors contributed to the increasing uncertainty among these immigrants in the United States following Hurricane Katrina and their concern for

their families and friends in the impacted countries. The uncertainty and disruption resulting from these events challenged traditional conceptions of the men as providers and heads of the family (see Safa 1995). Although this research is not focused on gender, its analysis reveals how this event also challenged traditional gender roles and expectations particularly characteristic of Latino males.

A Brief Overview of the Latino Population in Mississippi

Migration of Latino workers also has a long history; Latinos were part of the group of workers that entered the United States before and after World War I to satisfy the urgent demand for labor in the industrial economy. Also, Mexican immigrants were hired as strikebreakers in the 1920s to deal with the nationwide stoppage of the steel industry. Latinos have been part of this country since its inception in areas that are now U.S. states neighboring Mexico. Due to the economic and political tensions in many Latin American countries, illegal migration from countries, mostly from Central, but also from South America, is very frequent. As previously mentioned, as of 2005, it has been estimated that there are 10.3 million undocumented migrants in the United States—8.4 million are from Mexico or other countries in Latin America (Passel 2005). At the same time, the negative feelings and intolerance toward migrants go back to the early days, and they have long been accused of taking job opportunities from youth and minority workers. Nevertheless, social and economic research has shown that this is not the case and, in fact, they tend to be concentrated in areas with high demand for marginal labor (Winegarden and Boon Khor 1991; Espenshade, 1995).

More than half of the population of Latino origin is concentrated in the southern part of the United States. In the past decade, states with a traditionally small presence of Latinos (e.g., Mississippi and Alabama) have seen an increase. The massive demonstration that took place in Gulfport, Mississippi, on April 8, 2006, in support of the immigration proposal that, if adopted, could provide undocumented workers with a temporary legal status and a potential opportunity for permanent residency (*Clarion-Ledger* 2006) evidences the mobilization and growth of the Latino population in the region. Recent increases in the Latino population in Mississippi have been attributed to their labor participation in the development of tourism and construction along the coast, the growth of the poultry industry (Wallace and Murray 2002), and their longstanding involvement in the fishing industry.

A quick look at the employment and salary statistics of this group suggest that Latinos are mostly concentrated in low-wage jobs. Latinos are nearly twice as likely to work in service occupations and earn lower salaries, and they are almost three times more likely to live in poverty when compared to non-Latino whites (U.S. Census 2003). Historically the earnings of undocumented workers have been

lower than those of legal immigrants. Because of their illegal migratory status, these individuals are forced to provide cheap labor. Passel (2005) estimates that the income per individual in an undocumented family is less than half the income per individual in U.S.-born families.

Disasters and Vulnerability

The disaster literature states that disasters are social occasions (Quarantelli 1998), implying that disasters are a major vehicle for studying individual and collective social behavior. Moreover, Wisner et al. (2004) contends that disasters cannot be segregated from everyday life; they are "unfolding" events. In other words, natural disasters are processes that should not be perceived as enclosed and limited to temporal units; rather, they are the intersection of historical social practices with a natural hazard. Oliver-Smith (1998) claims that a disaster is "a process/event involving the combination of a potentially destructive agent(s) from the natural, modified, and/or constructed environment and a population in a socially and economically produced condition of vulnerability, resulting in a perceived disruption of the customary relative satisfaction of individual and social needs for physical survival, social order, and meaning." Therefore, the historically inferior social and economic structural properties of undocumented workers place them in the lower level of the social structure and accentuate their vulnerability.

Latinos and Undocumented Workers as a Social Group: The Structuration of Vulnerability in Disasters

In the book *Response to Disaster: Facts Versus Fiction and Its Perpetuation*, Fischer (1998) notes that only a small number of researchers have used theory to better understand and analyze disaster processes, and he urges the integration of theory and research. In an attempt to fill the breach between theory and research, and having found very distinctive patterns of inequality, the use of structuration theory affords an opportunity to understand the differential experiences of these social actors and to analyze issues of agency and structure in disasters.

The discussion about the "duality of structure" presented by the British contemporary social theorist Anthony Giddens (1984) could help us illuminate issues related to vulnerability, agency, and disasters. Applying Giddens' structuration theory can help us understand how the power or transformative capacity of the individual agent is mediated by structural properties or characteristics that shape the social structure and how the individual agent enacts social action in a collective crisis. In his discussion on structuration theory, Giddens states that the social structure, which he defines as the rules and resources used by social actors to guide action, is not external to the individual. On the contrary, he claims that

the individual lives in a constant reflexive relationship with the social structure. It implies that the individual agent maintains a continuous interaction with the social structure that informs or mediates not only social action but also his or her relationship with that same social structure. In other words, the agent and the social structure maintain a mutual or a dual relationship. However, their power to affect their environment is also influenced by their location in the social structure. Those rituals that individuals adopt to interact with their social structure become rules that are recreated within a dynamic social structure. For this reason, the relationship between the agent and his or her social structure is viewed as reflexive or resulting from continuous interactive feedback between actors and structure. The individual is, therefore, dynamically engaged in social action. Nevertheless, it emphasizes that this social action is mediated by structural properties or the societal position of the agent.

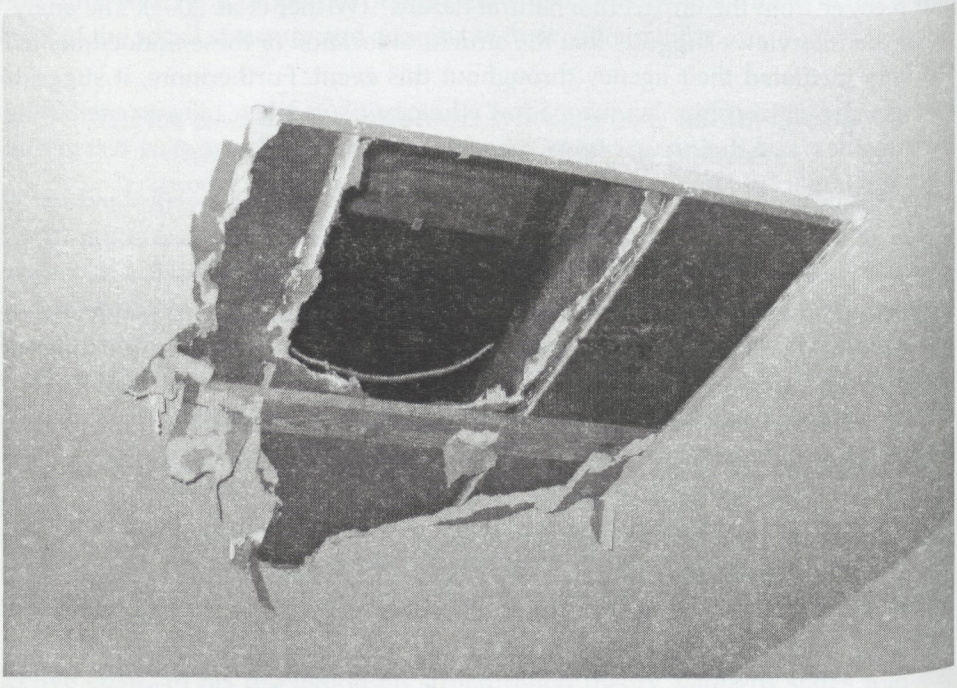
If we argue that disasters are social events and, more importantly, that they cannot be detached from everyday life, we can then argue that the pre-existing structural properties or characteristics of an individual agent are also present and manifest in disasters. Therefore, those characteristics can elicit or constrain the choices for protective action and the capacity of the individual to "anticipate, cope with, resist and recover from the impact of a natural hazard" (Wisner et al. 2004). The analysis of the interviews suggests that the structural location of these undocumented workers mediated their agency throughout this event. Furthermore, it suggests that gender, citizenship, language, and ethnicity played key roles in mediating their agency and their capacity to prepare, cope, respond and start recovering from the impact of Hurricane Katrina in comparison to other groups.

Structural Properties and Disaster Preparedness

Undocumented workers, when compared to other structural groups, and even to other Latinos with different structural characteristics, experienced a more difficult situation and confronted additional challenges or obstacles to their agency. For instance, limited access to transportation combined with their illegal status prevented Alonso, Humberto, and others that spent the hurricane with them, from evacuating the community (see Figures 1 and 2). While lack of access to transportation forced thousands of individuals to stay in exposed areas, for these individuals the issue was exacerbated by their illegal migratory status. As Alonso, who used to work in the oyster packaging industry, recalls:

> *We tried to get out but unfortunately the car of my friend . . . the one that was renting the apartment in which we were living . . . the car headlights stopped working. It was one of those cars that the headlights flip up and we couldn't open them . . . there was no way . . . we tried even with a hammer but there was no*





FIGURES 1 and 2: Site of vertical evacu ation of Latino workers trapped by the storm surge in an apartment complex in Mississippi

> *way, and we decided it was too late and we couldn't travel like that because it was Sunday like at 6:30 . . . we were on our way to the shelter but unfortunately that thing stopped working and we had to return.*

The fear of being stopped by the police appeared to be the main reason for their decision to return and remain in their apartments in the area of Pass Christian. Alonso elaborates:

> *Even when we got back to the apartment we were thinking that we should have gotten out of there . . . we should have not stayed there . . . that we should have kept going even without the headlights and that the police was not going to stop us because it was an emergency . . . but you know . . . you don't want to get in trouble with them and we stayed and we lost everything . . . the water started rising and we made it to the roof and when we were there we were just praying and asking God to save our lives.*

The fact that they were undocumented migrants deterred them from continuing their way to the shelter. Even when they decided to evacuate to protect their lives, their undocumented status prevented them from doing so. Here we see how citizenship, as a structural property, mediated and constrained their agency. These individuals received information about the threat and personalized the risk, but, because of their illegal status combined with their lack of access to material resources, were unable to attain the safety they desired or to take the protective measures they would have preferred.

Structural Properties and Public Warning

The media plays a primary role in communicating warnings to the public (Haddow and Bullock 2003). The disaster literature states that the media can also serve as a mitigation tool (Quarantelli 1996) because of their capacity to disseminate information to large groups and create awareness of potential threats. However, warnings should be clear and understandable, must meet the needs of the audience, and must provide accurate and reliable information that can allow individuals to take adequate protective measures (Rodríguez et al. 2006).

According to our interviewees, language barriers limited their access to information through the media. Their poor understanding of English mediated the experience of some of these individuals. Due to their inability to understand the official announcements, they claimed that their sources of information were mostly friends, neighbors, and coworkers. This validates previous research that has found that Hispanics are more likely to rely on their familial networks to assist them in preparedness activities and as a source of information (Morrow 2000;

Blanchard-Bohem 1997). These individuals were all native Spanish speakers and, even though some of them are able to communicate with English speakers, their knowledge and understanding of the language is limited. In their homes they speak Spanish and English remains a second language they use at their workplace or to communicate with English-only speakers. Their incapacity to fully and clearly understand the warning information made all of them underestimate the threat. As Mario explained:

> *Well let's say I heard about the hurricane, the supervisor at work told us, the other people that were there said that the police drove through with a loudspeaker saying that we were supposed to leave . . . but we thought it was not going to be that serious . . . or let's say we did not understand.*

Although all respondents said that they were aware of the potential hurricane, only Lorena said she understood that the threat was a serious one. Nevertheless her experience diverges from that of the rest. First, she indicated that she got most of the information through a Spanish-speaking TV channel. Since the broadcaster she mentioned is only available on a cable network, those who did not have access to this paid service (in this event, the majority of the interviewees) would not have received those warnings. In addition, research has identified gender as an important predictor of risk perception and, more specifically, that women are more likely than men to have heightened perceptions of risk and take protective measures (see Flynn, Slovic, and Mertz 1994).

In conjunction with differences in perception between genders, the inability to completely comprehend or obtain accurate information resulted in the men concluding that the hurricane did not pose a serious threat to their lives and their livelihood. Respondents claimed that they knew about the hurricane but never thought it was going to be so intense. Additionally, some of them claimed that this was their first experience with a hurricane, and they did not know what to expect. On the basis of these circumstances, it is argued that language served as a structural property affecting and limiting the agency of these individuals. Not able to completely understand the official warnings, they had to rely on their social networks. For those such as Diego, who was a recent arrival in the United States and had a less established social network, options were even more seriously constricted. Diego anxiously narrated:

> *But I'm going to tell you . . . I was just getting here . . . I had a week of being here when it happened . . . and yes I was hearing the comments . . . and seeing that people were emigrating but we didn't have anyone to take us out of there. There was no ride . . . and then how? I don't know the place. There was no way, so we had to put up with it. I had just got here. I've never been here before. I don't know*

> *if it was the ignorance or that I got here with no money . . . or that I don't know the place. If it was not for the friends here I would have never moved from there because I just don't know. I came where they brought me to. I didn't know. I had seen on the news about how those disasters happen . . . but I took it like very tranquil. I thought it was not something major. But then when it really happened . . . uff! It scared me!*

As described by Diego, he crossed the U.S.-Mexico border a week before Hurricane Katrina. His lack of knowledge of the area combined with not understanding the local language, his undocumented status, and economic hardship increased his vulnerability to this event.

Structural Properties and Response to Catastrophe

Uncertainty and the severe disruption of everyday life was evident following Hurricane Katrina's landfall along the Mississippi shore. Quarantelli (2005) makes a distinction between catastrophes and disasters that was easily observed during our visit to coastal communities and shelters in Harrison County. First, the coastal areas were desolate; almost no residents could be found because neighborhoods were either completely washed away by the storm surge, blown apart by the wind gusts, or had suffered flooding due to the extensive rain. Curfews were in place and continued evacuation in some areas was mandatory for safety or public health reasons. Identifying or trying to reconstruct a mental image of communities like Pass Christian, Gulfport, and Long Beach was almost impossible. Not only did homes no longer exist, but neither did neighborhoods or public buildings.

Our Latino interviewees manifested feelings of uncertainty and frustration. Their uncertainty was mostly tied to two issues: locating housing for themselves, and their inability to send money to their families "back home." Finding a place to live, most of these workers argued, has been a major issue. They reported that renters often require either a social security card or proof of salary and, since they are undocumented and work in the informal economy, they are unable to provide this documentation. On the other hand, some respondents indicated that their families were also experiencing the aftermath of other natural disasters in their home countries; our interviewees' inability to alleviate their families' stressful situations was one of their main concerns. The incapacity of these men to send remittances to their families challenged traditional conceptions of men as providers and breadwinners (see Safa 1995). Their families rely on them to fulfill their daily needs, and the situations experienced by these workers in the United States directly affect the entire family. Losing everything was a major source of frustration among these workers. As Miguel described it:

> *It is very sad because it feels like failing because we lost everything . . . you know a lot of them lost the few things they had . . . and even me that haven't been here that long . . . I had a couple things and now everything is gone.*

Certainly, thousands of individuals were in the same situation along the Gulf Coast; but because our interviewees occupied one of the lowest rungs of the social ladder, their situation was different from that of others—and even among them, there were certainly structural differences. For instance, when discussing issues related to housing, Hector claimed that the landlord of his apartment complex charged some tenants the rent for the month of September, even when the apartment had been ripped apart by the wind gusts. After paying their rent, the landlord informed them that evacuation from the area was mandatory and refused to reimburse them the rent money. However, Hector stated that the action of the landlord was unlawful and that he was thinking about starting a legal process against him. As Hector explained:

> *We paid the rent . . . we paid the rent and then the landlord kicked us out. He said we couldn't be there but I still have the receipts cause after things get calm I'm going to sue him. We paid and then he said he was not going to fix the apartments. He came with an order and asked us to leave. And he only charged Latinos . . . me and some Mexicans. He did not charge Americans and they told me . . . we all help each other there. We get along and I have papers so I'm going to get that money back.*

If, in fact, the landlord committed an unlawful action, Hector would probably be less fearful of confronting him and can potentially follow the legal procedures because he would not have to fear deportation. Because of their migratory status and fear of deportation, many of the interviewees stressed their wish to avoid governmental institutions. Government policies and laws, such as the U.S.-Cuba Bilateral Migration Agreement and those regarding Cuban refugees, place them in a different position than that of other immigrants. This suggests the need to analyze differences within Latinos.

Respondents also reported problematic issues related to shelter accommodations for undocumented immigrants. Humberto alleged that when he went with other undocumented migrants to a shelter in Orange County, food was denied to them. When asked by shelter officials if they were citizens, they truthfully replied that they were undocumented immigrants and were turned away. Nevertheless, another official intervened, and they were able to get a meal.

Another interesting finding is related to social rituals. Giddens (1991, 46) defines rituals as "day-to-day life coping mechanisms." In the case of undocumented workers, they had developed rituals to avoid any risk of being deported. Hiding from police—La Migra—or any government official was a theme that emerged in all interviews. This ritual is observed when we analyze the process through which these individuals decided to go to public shelters. Lorena firmly stated when asked about what triggered their decision to go to a shelter:

> *We are illegal but well you have to do something because; it was either La Migra or starving to death because we had nothing. After some days waiting and with nothing left we had to do it.*

With the exception of individuals who had to be rescued, none of these respondents wanted to seek aid or shelter until it was absolutely necessary.

Structural Mobility and Disaster Recovery

Three weeks after the hurricane hit, the recovery process was slowly starting. Brigades cleaning debris from streets and yards could be seen, but the amount of rubble was extensive. All of the interviewees expressed their desire to return to their pre-event communities. Unfortunately, those communities were almost impossible to find in the midst of the extensive damage to the built and natural environments. Furthermore, as mentioned previously, those communities were depopulated since all residents had been evacuated under mandatory orders. Not one of the interviewees failed to mention his/her longing to return to their previous jobs and daily activities. In fact, all the interviewees who had family members in their home countries that depended on their income said this was essential. At the same time, they all mentioned that they were slowly starting to work again and that, even though this event disrupted their already convoluted livelihoods, they were still going to be able to find jobs, especially in the construction area. Nevertheless, when asked about their current income or the average amount of money they made per day, they claimed that their income dropped dramatically after the event. This is because they lost their previous jobs and their current salary varied from day to day; they alleged that sometimes property owners or job bosses had refused to pay them after they had completed their work.

These workers come to the United States mesmerized by the idea of upward social mobility. Nevertheless, Hurricane Katrina exposed the vulnerability of some individuals that are part of a specific structural group. Through the rigidity of the social structure, these actors are confined to the lower levels of the social structure, their upward mobility is hampered, and their vulnerability is increased.

Research and Policy Implications

Throughout this chapter we illustrate how Latino immigrants prepared for, coped with, responded to, and began to recover from Hurricane Katrina. The chapter illustrated how the structural characteristics and everyday rituals played a role in and mediated the experience of a group of undocumented Latino workers. Furthermore, Hurricane Katrina served to evidence that disasters cannot be detached from everyday life and should be seen as social occasions in which social structures are reproduced.

Several policy implications and suggestions for the advancement of disaster studies arise from this study. First, it suggests the necessity for further examination of the underlying social, political, economic, and cultural issues that can mediate the agency of this ethnic group. Second, it illuminates the need to develop a better understanding of the shared vulnerabilities but also of differences among Latinos in the United States. Third, it emphasizes the need to continue working toward a more inclusive emergency management and warning system that acknowledges the changes in the demographic characteristics of the United States. Last, but not least, the study reveals a need to develop effective international aid programs that can assist populations such as this one in the aftermath of a disaster or catastrophic event. Latinos are currently the largest minority group in the United States and will continue experiencing rapid growth in the years to come. Furthermore, undocumented workers account for a large segment of the Latino population. Developing informed policies that effectively address their needs can have serious implications during future disasters.

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Crisis in Black and White: Katrina, Rita, and the Construction of Reality

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Abstract

Hurricane Katrina struck the Gulf Coast on August 29, 2005, causing catastrophic levels of environmental, structural, and economic damage in addition to a still-unknown number of human injuries and death. Less than one month later, Hurricane Rita threatened to strike the same region with greater intensity. In this chapter, we argue that while race is socially constructed, it is a deeply entrenched institution in U.S. society that shaped at least two separate realities in the Gulf Coast following these hurricanes. For whites, there were dangerous black men looting stores, marauding in the streets, and raping young women. While many whites were quick to racialize the alleged threat(s), they did not feel that race played a role in the rescue, relief, and recovery efforts of the authorities. For blacks, race was and is a factor in the authorities' efforts and in the mass media's coverage during and after the storms. Specifically, blacks felt that the predominantly white authority criminalized black survivors. This chapter investigates the construction of these two separate realities.

Keywords: hurricane, Katrina, Rita, U.S. race relations, Gulf Coast, social construction of reality, racism, color-line, interracial interaction

Hurricane Katrina struck the Gulf coast on August 29, 2005, causing catastrophic levels of environmental, structural, and economic damage in addition to a still-unknown number of human injuries and death. Less than one month later, Hurricane Rita threatened to strike the same region with greater intensity. The U.S. news media primarily showed faces of black evacuees desperate for food, water, and shelter, while calling them "refugees," as if they were from another country. Almost immediately, concerned citizens began asking what role race played in the events leading up to and following the storms.

In this chapter we argue that race is a deeply entrenched, socially-constructed institution in U.S. society that informed and shaped race-based realities in the Gulf Coast region following hurricanes Katrina and Rita. Specifically, we found that whites who evacuated either storm believed that black men were looting and marauding on a widespread and dangerous level, yet race was not a factor in the shortcomings of the governmental response to the storm. However, whites who remained in New Orleans during the disaster do not ascribe to that belief wholeheartedly; instead, they believe that the looting and marauding was much smaller in scope and confined to specific areas of the city. In contrast, we demonstrate that the beliefs of many blacks are that the levees near the Ninth Ward were intentionally destroyed and that black evacuees and survivors were criminalized. For these reasons, black respondents believe that race was a factor in the governmental response to the hurricanes and their aftermaths.

We first discuss the dominant theories guiding our analysis, the social construction of reality theory, the concept of hyperreality, and critical race theory. Then, we address how ethnographic methods were used to gather data in four cities of the Gulf Coast. Finally, we analyze how race informed and shaped peoples' experiences during and after the hurricanes, causing two separate realities to emerge.

Theoretical Background

Humans interpret the world through preconceived beliefs. In fact, we humans are even more likely to see what we believe rather than believe what we see (Strong et al. 2005). Human beliefs are largely influenced by language, which not only allows us to interpret our experience, but also shapes it (Sapir 1951; Whorf 1956). The categories used in language, such as the racial categories of black and white, emerge from the interaction of a group of people at a particular time and in a particular place within a system of power struggles, differences, and negotiations. Categories of understanding are therefore contextual, yet humans believe they have essential meaning and act as if the categories were real, which makes the categories real in their consequences (Thomas 1923). In turn, the sum of complex and organized patterns of ongoing action reifies the categories of understanding. Social categories

and conditions are produced, maintained, and changed through an interpretive, social process. Reality, then, is continuously and socially constructed (Berger and Luckman 1966).

Socially constructed reality can become exaggerated through language and symbols to the point that they take on stereotypical proportions. When members of society lose their ability to distinguish the stereotypes from material reality and begin to engage with the former without conscious acknowledgment, they have shifted into the world of what Baudrillard calls the hyperreal (1988).

Race, then, is a socially constructed category that varies both over time and across social contexts (Davis 1991; Espiritu 1992; Goodman 2000; Gould 1996; Nagel 1994; Spickard 1992). Additionally, race is fluid among individuals depending on context (Harris and Sim 2002). The contemporary U.S. social construction of race differentiates racial groups, gives dominance of one race—particularly the white race—over others, determines the life chances of all races, and perpetuates stratification (Van Dyke 1993; Maines 2000; Solórzano, Ceja, and Yosso 2000).

In the context of the United States, race is a category that is very entrenched. In fact, critical race theory posits that the category of race lies at the very nexus of life in the United States. It is an academic and activist movement that challenges us to consider the relationship that exists between race and all of U.S. society, and reveals that racial stratification is more powerful or enduring than is initially apparent (Crenshaw et al. 1995; Solórzano 1997, 1998; Aguirre 2000; Maines 2000; Solórzano and Yosso 2000; Delgado and Stefancic 2000, 2001; Bonilla-Silva 2004; Brown 2003).

According to a number of race theorists, several tenets support the methods and pedagogy of critical race theory. First, racial stratification is central to life in the United States; it is ordinary and ubiquitous, and it profoundly affects the lifestyles and life chances of racial groups. Second, racial stratification is difficult to comprehend and remedy because doing so challenges the dominant ideology of objectivity and meritocracy by exposing the self-interest, power, and privilege of whites. Third, racial categories are socially constructed and reproduced across both micro and macro levels; society invents, manipulates, and reifies race. Fourth, experiential knowledge, especially on the part of marginalized races, is legitimate and appropriate because the oppression of subordinate groups gives them the ability to understand and explain the meaning and consequences of racial stratification. Finally, critical race theory constitutes an interdisciplinary approach, which emphasizes the propagation of social justice as apposed to academic or purely scientific advancements (Crenshaw et al. 1995; Solórzano, 1997, 1998; Solórzano and Yosso, 2000; Delgado and Stefancic 2001; Brown 2003).

Due to the history of race in the southern United States and the nation's denial of race's significance (West 2001), we feel it is imperative to analyze the socially constructed and ubiquitous categories of race in the wake of life-changing events such as hurricanes Katrina and Rita while utilizing the aforementioned theories. Categories of race are contingent on time and place and, in the context of the United States, racial categories are powerful and enduring components that shape and inform the events of people's lives. The hurricanes struck an area of the world where race has been a defining social institution for hundreds of years, yet many in society want to argue that race no longer matters. Not only do the hurricanes reconstruct and reify the categories of race, but race also informs the realities and perceptions of the storms themselves.

Methodology

For this project, we employed ethnographic methodology in the form of observation and in-depth interviews. After receiving a Quick Response Grant from the Natural Hazards Center, we spent 11 days in the Gulf Coast region, beginning September 30, 2005. Six months later, we returned to New Orleans for a second 11-day trip.

During the first trip, we spent two days at a National Guard base where evacuees from both hurricanes were being housed. From there, we traveled south through Louisiana, visiting Bogalusa, Slidell, Lake Charles, and New Orleans. We spent six days in New Orleans, where we visited every major neighborhood. At each of these destinations, we spent as much time as possible becoming acquainted with the surroundings and gathering interviews.

We conducted our second research trip in March and April 2006, spending the entire 11 days in New Orleans. Again, we spent time in every major neighborhood of the city, observing what had changed and gathering interviews.

In total, we conducted 53 in-depth, formal interviews with evacuees and survivors, National Guard soldiers, Red Cross volunteers, and FEMA workers. Formal interviews lasted from 30 to 90 minutes, and we made every effort to find a location for the interviews that was comfortable for both the interviewee and the interviewer. In addition, we have made every effort to ensure the anonymity of the respondents when recording and analyzing their interviews. We recorded the interviews using digital voice recorders except when, on rare occasions, our equipment was not functioning.

In addition, we conducted 20 informal interviews with members of the same populations. Informal interviews differed from formal interviews in that the respondents in the informal interviews were unwilling or unable (due to job restrictions)

to sign the consent form or have their words recorded. Nevertheless, those who gave informal interviews were very willing to answer questions and share their experiences. Information gathered through informal interviews provides background information for this work, but has not been directly quoted.

While it was impossible to contact persons who were not present at the sites we visited, every attempt was made to select respondents from a wide range of demographic backgrounds. We completed this task by visiting a variety of shelters, relief centers, and affected neighborhoods and by actively approaching persons who appeared to be from demographics that had yet to be represented in the study. Therefore, we collected a purposefully stratified sample from a wide range of available respondents in order to present a simple confirmation of existing ideas about the racial world.

Respondents were grouped into two categories: 1) evacuees and survivors, and 2) rescue, relief, and reconstruction workers. Since the primary research questions dealt with race, equal numbers of black and white respondents were selected. An attempt was made to select an equal number of males and females, although males from the evacuee/survivor category outnumber females almost two-to-one. Tables 1 and 2 demonstrate the breakdown of respondents.

TABLE 1: Number of Interviewed Evacuees and/or Survivors

Evacuees/Survivors	Female	Male
Black	9	15
White	14	19
Other	0	1

TABLE 2: Number of Interviewed Rescue, Relief, and/or Reconstruction Workers

Rescue/Relief/ Reconstruction Workers	Female	Male
Black	2	3
White	4	2
Latino	0	4

While recognizing our role as social actors in the reification of race as a social category, we used our own racial identities as tools in the gathering of data. One of us is a black female and the other is a white male. Often in ethnographic research, respondents are reticent to speak across racial lines, especially when discussing the topic of race. Consequently, we matched the race of the respondent with that of the researcher whenever possible. This proved especially useful for the purposes of this research since interviewees often "othered" members of a different race when narrating their experiences. For example, respondents spoke freely about "them" (members of the other race) when speaking with someone of their own race. Given the entrenchment of race as a social category, we feel that the benefits gained from racial matching outweigh the cost associated with their individual reification of race.

Findings

In the late 1800s, W.E.B. DuBois observed two separate realities—one for blacks and one for whites. When conducting his research, the black people that DuBois interviewed saw prejudice as a "widespread feeling of dislike for his blood, something that keeps him and his children out of decent employment, from certain public conveniences and amusements, from hiring houses in many sections, and in general, from being recognized as a man" (1996 [1899], 322). Most whites, on the other hand, were unconscious of any such powerful and vindictive feeling and could not possibly see how such a feeling, if it existed at all, would influence the social condition of black people (1996 [1899]).

The study of the social construction of knowledge bridges the gap between taking reality for granted and questioning all reality in a philosophical manner. When gathering data, researchers often record multiple versions of the same event. As such, researchers must concern themselves with multiple realities, regardless of the ultimate validity of those realities or even the criteria used to judge validity (Berger and Luckman 1966).

In this research project we echo what DuBois reported over one hundred years ago—that whites and blacks experience two separate realities. Whenever possible, we provide corroborating evidence to show that not only was the experience different, but the event itself differed as well.

White Experience: Dangerous Blacks

Increased levels of television viewing cultivate in the viewer an understanding of society consistent with the patterns of television's pseudo-reality (Nacos 2000). Television's pseudo-reality leads to racial stereotyping, to an exaggerated belief

in the amount of violence in society, and to beliefs about what it means to be of a certain age, gender, or ethnicity in society (Gerbner 1995). When the viewer is unable to distinguish material reality from televisions pseudo-reality, the viewer has entered the world of the hyperreal. Through complex social interactions including the viewing of television, a hyperreal, hegemonic culture of fear of the "dangerous black man" has been cultivated in U.S. society (Glasner 2000). Our research showed that many whites along the Gulf Coast feared dangerous black men, though whites who stayed in their homes during Hurricane Katrina voiced some exception to this. These whites negotiated the stories of looting and lawlessness that the media broadcast about New Orleans with their lived experiences of nonviolence following the storms. Combining the two, they believed that violence happened on a smaller scale and in localized areas. We will first describe the more common narrative voiced by the whites who evacuated.

> **55-year-old white male:**
>
> *And, one policeman explained to me, he said, "Don't stop because they had carjacked twelve people—because they knew that was the only way out of the city—they'd stop you."*

This respondent spoke in coded language, but it was clear to the interviewer what he meant when he spoke of "them." When asked to clarify who "they" were, the respondent described black men. Regardless of the validity of the claim that "they" were carjacking motorists, both the actions of the police officer and the respondent reflected that "reality." As a result of the police officer's belief in the dangerous black man, officer told others about the danger. Similarly, the respondent sped out of town with the windows rolled up despite the heat.

In an attempt to ascertain whether there was a first-hand experience with carjackers, the researcher asked this follow-up question:

> Did you see anything when you were getting out? Any carjackings?
>
> *No. There were people on the road, you know what I mean? This was about eleven or twelve o'clock during the day, so I guess the people that do that sort of thing don't strike too much during the light of day. And, I think the police were getting up to it.*

In this quote, the respondent resolves dissonance concerning his hyperreality of dangerous black men with not actually seeing any of "the people who do that sort of thing" by explaining that carjackings don't happen during daylight hours and that the police had probably suppressed the incidents. Interestingly, the respondent's comment about carjackings not taking place during the day represents

another commonly held belief, which is that a higher percentage of violent crime takes place at night when, in fact, the majority of violent crimes occur during the day (Eller 2006).

The following respondent discussed overhearing a conversation about four men of color who he reports were planning to rape a white woman.

32-year-old white man:

There was a girl who was about to be raped there. I stopped it. I happened to overhear them talking about raping her. There was four of them.

In order to move past the coded race talk of "us" and "them," the researcher attempted to ascertain the race of the accused with the following probes.

Who was talking about raping them?

Just some teenage punks. They were talking about raping her. She was already on crutches.

What else can you say about them?

They were wearing gangster colors.

What colors?

Red, mostly. Bloods.

When his indirect approach proved unsuccessful, the researcher asked about race directly:

What race were these guys?

They were blacks. One was Hispanic. I think he had Hispanic in him. He probably wasn't full Hispanic.

Concomitant to the belief of the "dangerous black man," is dominant culture's belief in the "hypersexual black male" (Fanon 1967), which also gets applied to other men of color. It is likely that the respondent was also influenced by a belief in the hypersexual black male, and his actions were altered by what he overheard and interpreted. He reports stepping in front of the four men and telling them, "In order for you to get to her, you're gonna have to go through me."

The respondent's difficulty in classifying the fourth person illustrates the fluidity of race. One's racial identity relies on the interpretation of that identity as much, if not more than, the race with which the observed person actually identifies.

Wondering whether or not the respondent had done anything else to stop the would-be rapists, the researcher asked the following question of the respondent.

Did you talk to the cops?

I didn't see the point at the time, and I just didn't feel it was gonna go any further. I can be intimidating when I wanna be.

The respondent said that there were only two police officers at the temporary shelter where this event took place. However, the number of officers at the shelter represents yet another reality that breaks down along racial lines. Black respondents at the same shelter reported a multitude of police officers and National Guard soldiers.

Another variation of the "dangerous black man" is the unruly black person, regardless of gender, expressed by the following respondent. When the researcher asked if there had been anything at the National Guard base requiring an abundance of military and civilian police officers, the respondent reported that some people had gotten out of hand. When pressed, the only "out of hand" activity that the respondent had seen was complaining about the conditions on the base.

46-year-old white male:

There have been some things here. They had some people who got out of hand.

Who got out of hand?

Some of the evacuees did.

What did they look like?

They were black. I'm not prejudiced or anything, but a lot of them were black. They complained quite a bit.

What happened?

They had various things. There was arguing, that kind of stuff. And, a lot of people were fussing.

What kind of things have you seen?

There's been some thefts, there's been some, uh, a lot of complaints.

Have you seen any thefts?

I have not seen it myself, no, but I heard a lot about it.

Despite this respondent's statement that he is not prejudiced, his perception of reality seems to be shaped by an idea that black people are criminals. He reports seeing black people complaining and "fussing." We believe this adjective is an example of verbal appellation, the use of a positive term to describe a behavior that is valued or justified if one category of person engages in it yet a more negative term is applied if a person from a different category engages in the same behavior (Strong et al. 2005). For example, adults often use the verbal appellation "active" when describing a boy who pushes another child, yet a girl performing the same action might be described as "aggressive." Because of the dominant belief in the "dangerous black man," this respondent likely interprets otherwise legitimate complaining on the part of black evacuees as "fussing."

The respondent has also heard of some thefts. He believes the stories about thefts despite not having first-hand experience of them. His reality of thefts was likely buoyed by both a cultural image of the black man as criminal and also by his witnessing of what he describes as fussing on the part of black evacuees.

In addition to dominant culture's belief in the "dangerous black men," there were credible sources helping construct the looting and marauding realities. The media released reports of looting, marauding, and raping in New Orleans following Hurricane Katrina. For example, Dowd (2005), of the *New York Times*, wrote, "America is once more plunged into a snake pit of anarchy, death, looting, raping, marauding thugs, suffering innocents, a shattered infrastructure, a gutted police force, insufficient troop levels and criminally negligent government planning." In addition, Tinkler and Passmore (2005), of the *Herald Sun News*, wrote, "Gangs stalked the tourists and women were threatened with rape." If these stories are true, black men likely perpetrated a portion of the lawlessness. However, we believe that, while there may be a kernel of truth (de Young 2004) to these stories, the majority of them are rumors; reporters and researchers alike have had difficulty in finding people with first-hand reports of violence or lawlessness. In fact, following the immediate aftermath of the storm, many media outlets corrected the assertions they made in the days following the first storm. Carr (2005), of the *New York Times*, wrote, "But many instances in the lurid libretto of widespread murder, carjacking, rape, and assaults that filled the airwaves and newspapers have yet to be established or proved, as far as anyone can determine. And many of the urban legends that sprang up—the systematic rape of children, the slitting of a 7-year-old's throat—so far seem to be just that."

Our own research revealed the same difficulty in finding respondents with first-person accounts of violence. The 46-year-old white male quoted earlier in this section is our only respondent who reported a first-hand account of violence. However, he does not claim to have actually witnessed violence, only

the planning of violence, which indicates that the perpetrators were not very committed to violence.

In comparison, many of our white respondents who remained in New Orleans had narratives of cooperation even though they were in the city where the bulk of violent and lawless stories were being reported. The following respondent speaks of a neighbor who evacuated people by boat.

> **76-year-old white male:**
>
> *He said he could help people. He had a boat full of gasoline cans. The first responders were really the volunteer boatpeople of New Orleans. Those were the first ones that did some good there with their boats loaded up.*

When asked about the news reports about his city of New Orleans, the same respondent had the following to say.

> Were there any stories that concerned you, watching the TV?
>
> *Well, I'll tell you what concerned me. I'm realistic enough to know that we've got that, we talk about that 10 percent 'bad dudes' in a population. I'm realistic enough to know that it exists. But, what really bugged me is the national media put so much emphasis on looting that it would have sounded like—to the general public in St. Louis or in Denver, Colorado—it would have sounded like there was nothing but a riot going on in the whole city. It just wasn't the case.*

The respondent has a desire to protect New Orleans' national reputation. He is aware that New Orleans is a black-majority city, and he believes that 10 percent of any population is "bad dudes." He does not feel, however, that either of these things should reflect poorly on the city of New Orleans. Like many others from New Orleans, he likely believes that the racial diversity of the city is one of its strengths. It is likely, however, that racial stereotypes still influence his construction of reality concerning "bad dudes," as the following quote from his interview suggests.

> *Again, that 10 percent of bad dudes. Now, if I said those bad dudes were all black, I'm a bigot. And, anyway, you don't say that. But, it's a fact; that was the bad dudes. Not that they couldn't have white people doing the same thing. But, this mass of humanity pushed together in the [Super]dome, who were mostly black, mostly poor. And that 10 percent. And they got 50 percent of good people being victimized by the 10 percent. But, when you see that in the media, aw man. It's devastating to our image. It's like, like we got a race riot going on down here. That really bugged me. That bugged me more than anything else.*

We see a nuanced understanding of race in the response of this individual. At the beginning of the interview, the respondent volunteered that his opinions are a little bigoted. He had seen the media reports of violence in the Superdome, the stadium where many evacuees fled immediately following Hurricane Katrina, and in the surrounding areas. Still, he appears to negotiate his understanding of race and the reports he had seen on TV. On one hand, he says that *all* the "bad dudes" were black. On the other hand, he acknowledges both that white people are capable of the same behavior and also that there were more good people in the Superdome than bad.

Whether or not the respondent believes that there exists a close association between violence and black men is not entirely obvious. He did, however, feel that the media reports of violence were exaggerated, and he believes they were exaggerated at the expense of New Orleans' image. He is quoted as saying:

> *That, that really bugged me. And, I'm blaming the media. But, look, it's their job to report, number one. Number two, what you going to report? Dull stuff? But, that's not the whole story. That really bugged me. It made an image, a terrible image, worse than it really was.*

Most white respondents who stayed in the city during and immediately after Hurricane Katrina had responses that were similar to the one quoted here, whereas white evacuees tended to respond with narratives of dangerous black men. We believe the difference occurred because those who were in the city had to negotiate their firsthand experiences of cooperation with the contrasting images they saw in the media. The white respondents who left were more likely to let racialized rumors and secondhand knowledge influence the construction of their reality.

Black Experience: Levees Blown Up

While the cultural narratives around dangerous black men haunted the white imagination during and after Hurricane Katrina, blacks were negotiating a similarly frightening narrative: that of a dangerous, abusive, and racist government. Perhaps nowhere was this concern more clearly articulated than in the belief, held by many blacks in the New Orleans area, that the levees protecting the city—especially those protecting black neighborhoods—had been intentionally destroyed. Many whites, including those in the state and federal government and corporate mass media, immediately dismissed this contention as ludicrous. However, for blacks in the Mississippi Delta region, the thought of government officials blowing up the levees above the Lower Ninth Ward in order to protect the central business district and richer, whiter neighborhoods was more than idle conjecture; it was history repeating itself (Dyson 2006). Though most blacks in the Delta were not alive when the

Great Mississippi Flood of 1927 occurred, the majority is aware of the black communities destroyed and black lives lost due to the decisions of those in power.

In 1927, ineptitude, greed, and mistreatment of poorer neighborhoods helped the Mississippi's flood of that year do the damage it did. For example, New Orleans was never in any danger of flooding since many levees had broken upstream. Nevertheless, bankers and businesspeople of the city dynamited the levees downstream of their city in order to protect their investments. As a result, 10,000 residents of New Orleans, most of them black, were flooded from their homes. With only a few exceptions, the displaced residents were never compensated for their losses (Barry 1998).

Just as racial stereotypes informed the construction of whites' realities, history influenced the construction of blacks' realities. The following respondent demonstrates how his knowledge of the previous flood influenced his reality concerning the floods following Hurricane Katrina.

> **42-year-old black male:**
>
> *I heard they blew up them levees. You know, they did that before, right? But, I tell you what, ain't no accident them levees broke [following Hurricane Katrina] and it ain't no accident black folk were left to die.*

In this case, the respondent is able to believe that the levees were intentionally destroyed in 2005 because of the documented intentional destruction in 1927. Without evidence to the contrary, the previous conspiracy informs the present hyperreality.

As with white respondents and dangerous black men, we were unable to find a black respondent with conclusive firsthand experience of the dynamited levees. We did, however, interview the following forty-something black man who reports having heard the explosion that destroyed the levee protecting the Lower Ninth Ward.

> *I'm telling you, I heard it blow. It was an explosion and the water rushed in. I couldn't get out anymore. I ended up on my roof. But no . . . no one's gonna tell me they didn't blow them levees. I was there! I heard it. I was there. And no levee breaking sounds like that. They blew 'em before and they blew 'em now. And they don't give a damn 'cause they know no one's gonna listen to us.*

While conspiracy theories are often attributed to the most destitute (and therefore desperate) members of a society, one of the more striking attributes of the levees conspiracy theory is that it seems to cross class lines. For instance, the following

interviewee is highly educated, solidly middle-class to upper middle-class and a leader in the New Orleans black community, yet she finds the conspiracy theory quite believable:

54-year-old black female:

Oh, I don't know [if the levees were blown], but it wouldn't surprise me. From what I've seen and heard, yeah, they very well may have. See, this is New Orleans and we have a unique history, a unique culture, lots of different people mix here. But never forget this is still the South. And when it comes down to it, who do you think they're going to protect?

For many whites, the contention that the levees were intentionally destroyed is absurd and is not supported by factual evidence; nevertheless, the reality for many blacks is quite different. If it happened before, they wonder, and the same power structures are basically in place as were 80 years ago, why not this time?

White Experience: Race Not an Issue

White respondents reported having negative experiences with black evacuees following the hurricanes, but they reversed their position when discussing the rescue, relief, and recovery efforts. When asked if race played an issue, this respondent had the following to say.

33-year-old white female:

Not at all.

Do you think these disasters say anything about race in the U.S.?

No, cause, no. I don't look at what color your skin is. I cut myself, you cut yourself; we all bleed the same color.

Other white respondents had similar things to say. The following respondent does not think that race had anything to do with the government's response to the hurricanes.

46-year-old white male:

Do you think the response for New Orleans would have been different if it were a predominantly white city?

I don't know. That's a tough question. It coulda been. I don't really look at it as race, cause I think . . . Course, you know, they're more poor, and not as much possessions as the others, but I don't look at it as a racial thing.

While denying that race had anything to do with response efforts, the respondent links race to class. By linking race and class, many people are able to justify racial stratification through class dynamics. Eduardo Bonilla-Silva, a critical race theorist, identifies this type of justification as part of a new type of racism: colorblind racism. "[Color-blind racism] aids in the maintenance of white privilege without fanfare, without naming those who it subjects and those who it rewards" (Bonilla-Silva 2004). In this case, the respondent is able to note that a racial difference existed without naming race as a cause of the difference.

The following respondent echoes the white reality that race was not a factor in the aftermath of the hurricanes.

> **67-year-old white female:**
>
> *Race did not matter. The first water breach was not a levee. The water breached at a ship canal, not a levee in the ninth ward. No, it was definitely not race.*

In fact, with only one exception, white respondents believed that race had nothing to do with the failures of the rescue, recovery, and relief efforts. The lone white dissenter is married to a black woman.

Black Experience: Race Matters

While blacks did not report differences along lines of race in the actions of evacuees and survivors, they did experience differences in treatment from the authorities as a result of racial categories. The cultural images that inform collective memory, and therefore the construction of black reality, include the flood of 1927 that inundated the Mississippi Delta resulting in the purposeful drowning of hundreds of blacks, the assassination of Martin Luther King Jr. in 1968, and the beating of Rodney King by four white police officers in 1991, to name just a few.

A collective distrust of government by blacks helps construct their reality that race played a role in rescue operations. Consider how the Mississippi government delayed ratifying the Thirteenth Amendment. Mississippi did not ratify the amendment to abolish slavery for 130 years after the rest of the country had done so. Similarly, Alabama citizens voted in November 2004 to retain segregation-era language—mandating segregated schools and poll taxes for blacks—in the state constitution. In June of 2005, 21 U.S. senators initially chose not to sign a resolution officially apologizing on behalf of the Senate for not making it a federal crime to lynch blacks. Perhaps it is the cultural memory of events like these that aids in the construction of the following reality for this respondent.

40-something [age estimated] black male

Yeah, race was an issue. Not allowing blacks on the bridge into the city during evacuation. Why not? Because, if you're a black man, you are a thug. And, why did it take Bush four days to respond?

The bridge to which this respondent refers is the Crescent City Connection, which separates New Orleans from the predominantly white town of Algiers. Armed authorities in Algiers turned thousands of evacuees away when they attempted to walk across the bridge to flee the flooded city of New Orleans. Just as the previous respondent believes that race was an issue on the bridge and in the response from the federal government, the following respondent believes that race played a role in her and her white husband's interactions with the National Guard.

62-year-old black female:

There were a lot of times when if [her husband] wasn't white, we wouldn't have gotten things. He would have died. But, they [soldiers] knew we weren't criminals because [her husband] is white.

The reality for the following respondent was that the impact of race followed him even when he left a temporary shelter to take a walk. He relayed the following interaction.

62-year-old black male:

A man was cleaning up, and he asked me, 'Do you know where you are?' . . . I said, 'Yeah, I'm in DeRidder.' He said, 'Yeah, but you're in Ku Klux Klan turf. You're in Confederate territory. They don't want you here; they don't like you here.'

While this respondent did not encounter any evidence of KKK activity firsthand, his understanding of the situation changed and he behaved more cautiously. Likewise, another respondent warned the black partner of this research team to be careful. The respondent warned that the researcher was in Klan territory and could be in danger if people thought that the white male researcher was her romantic partner.

Black Experience: Blacks Criminalized

Not only did black respondents feel that race played a role in rescue and relief efforts, but they also believed they had been criminalized because of stereotypes about black people. Research concerning the stratification of race in crime shows

that U.S. blacks, especially black males, have a history of being criminalized. For example, one out of every three black American men spend time in prison, and they are seven times more likely to go to prison than white American men (Petit and Western 2004). One could make a cultural argument that the high rates of black incarceration are because black men are more criminal in nature than white men; however, the cultural argument does not explain why perpetrators of violent crimes are more likely to be jailed if their victim is white (Eitle, D'Alessio, and Stolzenberg 2002). Nor does the cultural argument explain why black defendants are more likely to be incarcerated and receive longer sentences than their white counterparts (Steffensmeier and DeMuth 2000), or why a large black population in a state increases the probability of that state having a legal death penalty (Jacobs and Carmichael 2002). In sum, something other than a "criminal black culture" is to blame for the criminalization of black people.

The following respondent believes that black people have been judged by assumption. Most likely, that assumption is based on the fear of "dangerous blacks," as discussed previously.

67-year-old black male:

In every place where [black] people are displaced, the police have been overbearing, judging people by assumption. I have been so disgusted I can't sleep at nights.

This respondent believes that a criminal assumption has been made about the race of most of the evacuees. To illustrate the results of the criminal assumption, he continues with the following:

The police were very rough, demanding. There was more policemen there than, as they call us, "refugees." The police were everywhere. They'd turn their lights on and off when they got ready. Shine their light in your face. Then finally, they went and got the National Guard troops. Troops walking around with weapons.

After making the last comment, the respondent complained about the use of the word "refugees." While he did not address it directly, the word contributes to the construction of criminalization. According to a common definition of the word, a refugee is someone who takes refuge "by going to a foreign country" (Encarta World English Dictionary 1999). Implicit in this definition is the notion that refugees are foreign. By "othering" a group of people as foreign, it becomes easier to believe members of the group are of lesser status than nationals. A lower perceived social status then makes it easier to believe that the group members are criminals.

The respondent concludes with the following statement, with a suggestion for how the white authorities should have responded.

67-year-old black male:

They had fellas like that, seventeen or eighteen years old, with a gun. And, they was all white fellas, over black displaced people. Drowning people out there. You don't go out there with more weapons. You go out there with more boats and life rafts, and more people to pull those people outta there.

Most of our black respondents agreed with the sentiments stated above. The following woman says something very similar.

56-year-old black female:

Why you [the National Guard] coming up in here with all that muscle? Locked . . . loaded. There have been no problems here . . . What are you so afraid of?

While this respondent does not place the cause for criminalization squarely on assumptions, she clearly doubts that the firepower of the National Guard was necessary. In addition, she concludes that the National Guard feared *something*.

Lest someone raise the issue that not all the evacuees were black, several respondents noted that whites in the shelters were simply unfortunate to have been placed with so many black people. More than one black respondent mentioned the "unfortunate whites" who were also treated like criminals simply because they were being housed with so many people of color.

We witnessed evidence that the treatment of whites and blacks on the part of the National Guard was different. Black evacuees, especially black single male evacuees, were policed more heavily on the National Guard base we observed. At that base, there were three blocks of barracks in which evacuees were housed. The first block housed families, the second housed single women, and the third housed single men. In each block, the evacuees self-segregated by race. In the first two blocks, there was very little police presence, yet in the third block, especially the end of the block where the single black male evacuees had taken residence, there was a noticeably larger number of police officers patrolling the area. One of our informal interviewees, a National Guard soldier who spoke on the condition of complete anonymity, confirmed that the police presence was greater around the single black men and it had been since the evacuees arrived.

Thus, the reality for most of our black respondents was that they had been treated as criminals due to assumptions about their race, regardless of whether or not they had committed any crime. The treatment they received included over policing and

an excessive show of force. The nonblacks who received the same treatment were simply unfortunate to have been of the minority race in shelters where the majority of evacuees were black.

Conclusion and Discussion

During times of apparent tranquility, dominant culture glosses over the fault lines that divide society, hiding them from much of the population. Adversity, however, acts like a strong wind. It tears away the outer layers, ultimately revealing what lies underneath.

Many people will ask, "Did whites and blacks experience the same events during and following the hurricanes and interpret those events differently, or were they subjected to differing events because of their race?" This research provides evidence that both are true.

First, race did play a role in the construction of reality following hurricanes Katrina and Rita. White hurricane survivors told stories of anarchy, and many blamed the lawlessness on black survivors, especially black male survivors. Despite their conviction of marauding black men, white respondents did not believe that race played a role in the governmental rescue, relief, or recovery efforts. For the most part, whites felt that race was simply not an issue, whereas class might have played a role. In contrast, black survivors believed that race did matter in the rescue, relief, and recovery efforts. If the majority of hurricane survivors had not been black, they felt the outcome of the hurricane would have been much different. The experienced reality for black respondents was that the levees had been intentionally destroyed and black survivors had been criminalized due to assumptions made about their race. Second, some of the events that respondents attended were different, and some of the treatment they received was different. There were isolated cases of looting, yet looting and marauding was not widespread and both blacks and whites were responsible. However, the media reported widespread looting and marauding and focused on black perpetrators. Whites who evacuated believed there was widespread looting and marauding because of their hyperreal experiences of watching televised news reports or hearing rumors. Whites who remained in New Orleans after Hurricane Katrina heard the news reports yet experienced the scene in front of them. As a result, their experience of reality was that there might have been isolated incidents, but those events were not widespread. Black respondents, whether watching the events unfold on TV or in front of them, relied on their previous experiences of media exaggerations, especially in terms of race. As a result, they were less likely to experience the reality of widespread looting and marauding. In addition, the policing of blacks, at least the

policing of single black males on one National Guard base, was different. We have no conclusive evidence as to whether or not the levees were intentionally destroyed.

The social construction of reality theory posits that categories are created and given meaning by society. Individuals interact and play roles that have grown out of mutual typification as each person observes the other and sees a pattern in their behaviors and responses. The typified behaviors and responses become habitualized in ways that allow each to predict the other's actions. These actions begin to develop a history and become historical institutions. As such, they develop objectivity based in that history. Individuals then begin to experience the historical categories as having their own reality and that impacts the individuals experiencing it. The categories are thus perceived as external, coercive facts (Berger and Luckman 1966; Van Dyke 1993). Hurricanes Katrina and Rita may not have dramatically changed the way people see the social reality of race, but they did reify the social reality of racial categories. Through observing the different ways in which race influenced peoples' experiences of the hurricanes, we are able to analyze how society constructs reality. As researchers and as citizens, the most important aspect of this analysis is the impact it exerts on material reality, distribution of resources, life chances, and the quality of life for all.

In future research we hope to analyze the way Hurricane Katrina constructed a hyperreality that affected how the National Guard and other agencies responded to Hurricane Rita, as well as how black Rita evacuees responded to predominantly white authorities based on what they had seen and heard about Hurricane Katrina.

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Part 4:
Issues in Disaster Response

Critical Care in Crisis: Decision Making in New Orleans' Hospitals

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Abstract

This chapter investigates decision making under uncertain conditions by examining the response and decision making of acute care hospitals in the New Orleans area before, during, and immediately after Hurricane Katrina and the subsequent flooding of the New Orleans area. The functioning of and safety within hospitals was compromised by structural damage, loss of utilities, and failure of communication systems. The qualitative research presented here relies on in-depth interviews with municipal emergency personnel and hospital administrators from the region's 15 key acute care hospitals to understand how emergency planning was practiced and to understand how medical staff coped with damage to hospital infrastructure, compromised health and safety of patients, and a strained ability to care for patients. Key lessons learned in New Orleans—the importance of developing resilient building systems, self-sufficiency, networking, staffing, communicating emergency plans, communicating after the disaster, and effective leadership—were gleaned from Hurricane Katrina and the flood but are applicable to emergency planning and leadership decision making for a variety of extreme events, not just for hospitals but for other organizations as well.

Keywords: hospitals, decision making, disaster, emergency preparedness, evacuation, Hurricane Katrina

At 9:30 a.m. CDT on Sunday, August 28, 2005, New Orleans Mayor Ray Nagin called for a first-ever mandatory evacuation of his city of just under 500,000 inhabitants. The evacuation was a response to the impending Hurricane Katrina, at the time a Category 5 hurricane churning across the Gulf Coast and expected to make landfall in Louisiana the next morning, August 29th. The evacuation order exempted government officials, prison inmates, hospital patients and staff members, tourists in hotels, and members of the media (Russell 2005; Glasser and Grunwald 2005).

Hospitals in the New Orleans area had begun preparations for Hurricane Katrina several days before. For essential hospital staff members—those designated as necessary employees when a hurricane is anticipated—preparing for a hurricane involved two major types of activities. First, hospital staff members prepared their homes and families, followed by packing what they would need for *camping* at the hospital, usually several days worth of personal items and supplies. Second, hospital staff members helped to prepare their hospitals, patients, and families of patients. That involved securing needed supplies, discharging as many patients as possible, and reassuring families that those patients remaining in the hospital would be top priority.

Like all staff members, hospital administrators prepared themselves and their families and then attended to hospital patients, staff, and facilities. Doing so meant reviewing, executing, and altering, as needed, their hospitals' emergency plans. Effective leadership before, during, and after a crisis may be the ultimate test of executives' leadership abilities and behaviors (Weick and Sutcliffe 2001). Have they thoroughly anticipated what might happen and how to respond? Have they secured the resources needed to sustain their hospital, its staff, and those who will shelter there? Will they be able to execute their plans? Finally, are they ready to make required personal sacrifices?

In the end, hospital administrators are held accountable for a hospital's hurricane plan and response. They are expected to make important decisions, no matter how uncertain and stressful the situation. Leaders must learn to make quality decisions in crises, sometimes through personal experience and often vicariously through others' experiences. It is vitally important that leaders in crisis learn and demonstrate four major leadership behaviors: "strategic awareness, resource mobilization, effective execution, and personal selflessness" (Useem, Cook, and Sutton 2005, 464).

This chapter contributes to the knowledge base of decision making under stressful and uncertain conditions by describing and examining the decision making and response of hospitals in the New Orleans area before, during, and immediately after Hurricane Katrina and the subsequent flooding of the New Orleans

area (Arendt and Hess 2006). The authors articulate various lessons learned at New Orleans hospitals as described by hospital executives and others knowledgeable about hospitals and disaster preparedness and response. The lessons learned are applicable to organizations other than hospitals, and to hospitals and other organizations facing not only hurricanes but also a variety of extreme events. Such learning has the potential to influence significantly both leaders' self-efficacy to make high quality decisions and subsequent performance (Bandura 1997).

The remainder of this chapter is organized as follows. The authors first explain the study's research methodology and provide an overview of the medical system in New Orleans. The second section chronicles Hurricane Katrina and the subsequent flooding of New Orleans. It describes the impact on hospital functioning, patient care, communication systems within hospitals, and the mandatory evacuation of medical facilities. The third section profiles how each of the 12 hospitals visited by the authors fared after Hurricane Katrina and the subsequent flooding. The fourth section articulates seven key lessons learned from this research about hospital planning for hurricanes and floods. Finally, the authors offer several conclusions.

Research Methodology

The methodology used to gather the information in this report was qualitative. Institutional Review Board approval was received in advance of the data collection. The authors traveled to New Orleans approximately one month after Hurricane Katrina and observed firsthand over a week's time the devastation wrought by Katrina and the subsequent flooding. In addition to observing and taking a thorough visual stock of 12 of the 15 acute care hospitals in Orleans, Jefferson, and St. Bernard Parishes, they met with and interviewed various individuals, including hospital administrators and staff members, their family members, security personnel, remediation personnel, public health officials, health association representatives, and federal, state, and local emergency experts. Locating hospital decision makers was difficult, since all Orleans Parish hospitals were closed during the first week of October. Followup telephone interviews were conducted with several hospital administrators who were unavailable during the authors' time in New Orleans. In all, 22 interviews were conducted, including face-to-face and telephone interviews. The median length of each interview was 45 minutes.

In gathering information from these diverse sources, the authors worked to develop a comprehensive, balanced view of New Orleans hospital decision making before, during, and immediately after Hurricane Katrina. A semistructured interview protocol was used to solicit information from each of the study's participants. The authors alternated asking questions and taking notes, and conferred after each interview to ensure mutual understanding of each participant's responses.

TABLE 1: Overview of Hospitals

Facility	City	Parish	Ownership	Licensed Beds	Damage	Post-Katrina Status	Current Status[a]	Available beds[a]
Chalmette Medical Center	Chalmette	St. Bernard	Investor-owned (Universal Health Services)	265	Extensive; hurricane and flood	Evacuated	Closed	0
Meadow-crest Hospital	Gretna	Jefferson	Investor-owned (Tenet)	207	None	Evacuated	Re-opened 11/6/05	116
West Jefferson Medical Center	Marrero	Jefferson	Not-for-profit	451	Limited; hurricane	Open	Open	352
East Jefferson General Hospital	Metairie	Jefferson	Not-for-profit	454	Limited; hurricane	Open	Open	454
Ochsner Clinic Foundation	Metairie	Jefferson	Not-for-profit	475	Limited; hurricane	Open	Open	455
Tulane-Lakeside Hospital	Metairie	Jefferson	Investor-owned (Hospital Corporation of America)	102	None	Evacuated	Re-opened 9/30/05	0[b]
Children's Hospital	New Orleans	Orleans	Not-for-profit	201	Limited; hurricane	Evacuated	Re-opened 10/10/05	143
Lindy Boggs Medical Center (Mercy)	New Orleans	Orleans	Investor-owned (Tenet)	187	Extensive; hurricane and flood	Evacuated	Closed	0

Facility	City	Parish	Ownership	Licensed Beds	Damage	Post-Katrina Status	Current Status[a]	Available beds[a]
Medical Center of Louisiana (Charity)	New Orleans	Orleans	Public	714	Extensive; hurricane and flood	Evacuated	Closed	0
Memorial Medical Center (Baptist)	New Orleans	Orleans	Investor-owned (Tenet)	317	Extensive; hurricane and flood	Evacuated	Closed	0
Methodist Hospital	New Orleans	Orleans	Investor-owned (Universal Health Services)	427	Extensive; hurricane and flood	Evacuated	Closed	0
Touro Infirmary	New Orleans	Orleans	Not-for-profit	567	Limited; hurricane	Evacuated	Re-opened 9/28/05	361
Tulane University Hospital	New Orleans	Orleans	Investor-owned (Hospital Corporation of America)	362	Extensive; hurricane and flood	Evacuated	Re-opened 2/14/06	97
University Hospital	New Orleans	Orleans	Public	329	Extensive; hurricane and flood	Evacuated	Closed	0
Veterans Administration Hospital	New Orleans	Orleans	Federal government	591	Extensive; hurricane and flood	Evacuated	Closed	0
All Hospitals				5649				1978

Sources: Louisiana Department of Health and Hospitals; Health Resources and Services Administration 2005.
Notes: a. As of April 15, 2006. b. Combined with Tulane University Hospital

The interviews' primarily open-ended questions focused on a variety of topics, including: planning and steps taken in advance of Hurricane Katrina, identification of individuals involved in emergency planning, management and staff response to Katrina and the subsequent flooding, the evacuation process and timeline, identification of issues faced and solutions implemented, what went well, and what might be done differently in the future. While all participants were asked the same basic set of questions, followup questions differed based on the content of each participant's unique responses.

Viewed as important by the authors were the lessons learned from *all* New Orleans hospitals: those that stayed open, those that evacuated and then reopened, and those that evacuated and may never reopen, at least not as acute care hospitals. An overview of the hospitals studied is presented in Table 1. Fifteen acute care hospitals provided patient care in the New Orleans area before Hurricane Katrina.

When the levees failed, and the water began filling the topographic bowl that is New Orleans, the hospitals near the center of the depression quickly flooded. Like most New Orleans residential and commercial buildings, hospitals in New Orleans tend to be about five to eight feet below sea level. Six of nine hospitals in

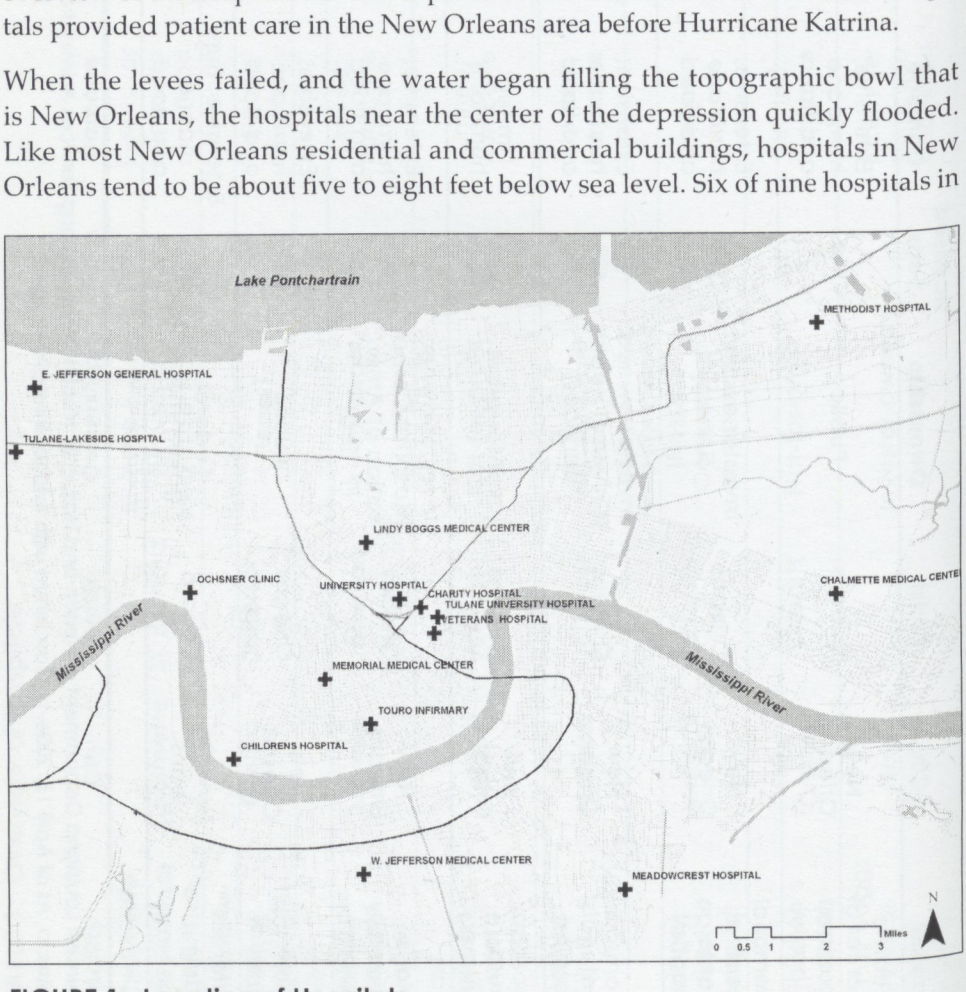


FIGURE 1: Location of Hospitals

Orleans Parish are located in the bowl—Lindy Boggs Medical Center, Memorial Medical Center, Medical Center of Louisiana at New Orleans (Charity), Tulane University Hospital, University Hospital, and Veterans Administration Hospital. Only two hospitals in Orleans Parish managed to escape serious flooding, Children's Hospital and Touro Infirmary. Both are located on relatively higher ground, closer to the levees that protect New Orleans from the Mississippi River. The ninth Orleans Parish hospital, Methodist Hospital, near the northeast shore of Lake Pontchartrain, flooded as well. The three Jefferson Parish hospitals on the east bank of the Mississippi (East Jefferson, Tulane-Lakeside, Ochsner) were spared serious flooding as the 17th Street Canal levee was breached on the Orleans Parish side. Likewise, the two Jefferson Parish hospitals on the west bank of the Mississippi—Meadowcrest and West Jefferson—were spared serious flooding, as there were no levee failures there. Finally, Chalmette Medical Center in St. Bernard Parish experienced massive flooding resulting from both the initial storm surge from the Intercoastal Waterway and the Industrial Canal levee breaches. Figure 1 shows the location of each of the 15 New Orleans area hospitals.

Together, the 15 hospitals were licensed for 5,649 beds. Ownership of the hospitals varied: one was owned by the federal government, two were publicly owned, five were not-for-profit, and seven were investor-owned. St. Bernard's Parish was served by one hospital, Jefferson Parish was served by five, and Orleans Parish was served by nine. Table 1 lists the hospitals by location, ownership type, and number of licensed beds.

One week after Hurricane Katrina, the number of beds available in the area's three open hospitals was 1,279, or 23 percent of the pre-hurricane capacity. As of April 15, 2006, the number of beds available in the area's eight open hospitals was 1,978. Thus, nearly eight months after Hurricane Katrina, New Orleans area hospitals had about one-third (35 percent) of the bed capacity before Hurricane Katrina. Seven hospitals remained shuttered as of April 15, 2006, with no firm announcements of reopening dates. Table 1 also lists the damage to and status of hospitals in New Orleans as of April 15, 2006.

Double Disaster: Hurricane Katrina Followed by Flooding

Hurricane Katrina was downgraded to a Category 3 hurricane by the time it made landfall on Monday, August 29, 2005, about 7:00 a.m. CDT, between Grand Isle, south of New Orleans, and the mouth of the Mississippi River. Sustained wind speeds were estimated at 125 mph, extending 125 miles from the hurricane's center. The worst of the storm hit New Orleans less than three hours later.

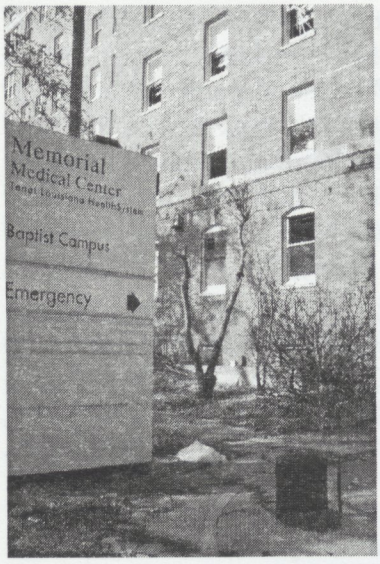


FIGURE 2: Damage at Memorial Medical Center

While Hurricane Katrina caused some damage to New Orleans hospitals, the facilities were generally spared from major damage. Trees were uprooted, windows were blown out, rain entered the buildings through air conditioning vents and other openings, roofs and rooftop equipment were damaged, and at least one emergency generator was destroyed (see Figure 2). Generally, though, property damage directly attributable to Katrina was minimal for all but a few hospitals. Chalmette Medical Center in St. Bernard Parish was a notable exception, having sustained major damage from Katrina's 30-foot storm surge as it made its way up the Intercoastal Waterway (see Figure 3).

By 8:00 a.m. CDT on Monday, August 29, Mayor Ray Nagin announced that water had topped the levees near the city's Lower Ninth Ward and St. Bernard Parish. Later that same morning, a large section of the 17th Street Canal levee gave way—sending water across the Lakeview community and into Mid-City, Carrollton, Gentilly, City Park, and neighborhoods farther south and east—and water from Lake Pontchartrain began filling the city. Though New



FIGURE 3: Damage at Chalmette Medical Center

Orleans had dodged the bullet of Hurricane Katrina, a second disaster was on its heels. It was this second disaster, widespread flooding that covered 80 percent of the city, that incapacitated the majority of New Orleans hospitals.

Water filled the streets, making roads prerequisite to surface transportation impassable. Water began to fill basements and first floors of the Orleans Parish hospitals. A hospital executive interviewed by the authors described what it was like to try to forestall the consequences of first floor flooding:

> *As the hurricane approached, we moved critical services from the first to higher floors. Services such as the ED [emergency department], central supply, and any expensive equipment. When the hurricane passed, we inspected the building, and found no damage on the lower floors. So we moved critical services back to where they belonged. Then, we heard rumors that the levees had failed, and that water was making its way into the city, toward our facility. So we began the process of moving critical services back to higher floors.*

City power was out, and hospitals were forced to run essential services on emergency generators. Neither air conditioning nor elevators were considered essential services. City water was unavailable, and rationing of potable water supplies was initiated. Even hospitals that did not experience flooding lost access to city power and water for about ten days. Some hospitals that flooded quickly were unable to access supplies that had been stored in basements and first floors. As the temperatures inside the hospitals continued to rise, hospitals became extremely unsafe places to be.

Every hospital executive interviewed expressed surprise at the combination of Hurricane Katrina followed by widespread flooding. That said, this double disaster was a known threat, if not a known certainty. Hurricanes and floods have a long history of influencing the social, political, and economic landscape of New Orleans and its surrounding areas (Barry 1997). Further, the citizens of New Orleans had been told by disaster experts—repeatedly—about the possibility of a devastating hurricane and flood combination (e.g., Ivor van Heerden, deputy director of the Louisiana State University Hurricane Center, NOVA 2005). Despite such warnings, many appeared astonished by the consequences of the city's failed levees.

How could anyone be surprised by what happened given the extensive research and media coverage of what might happen to New Orleans? There are at least two explanations for people's reactions. First, in their lifetimes, most people had not experienced a double disaster the likes of Hurricane Katrina and the subsequent flooding. The last such major disaster to strike New Orleans was Hurricane Betsy

in 1965. She was followed by flooding in the Ninth Ward of New Orleans and Chalmette (Forrest 1979). Personal experience is a powerful, though often inaccurate, teacher. One hospital executive who had lived in the New Orleans area for a decade told the authors, "You get jaded after a while. Every hurricane that I've seen since I've lived here has produced minimal damage. So, you figure that you're going to be OK."

Second, trying to visualize what 10 feet of water will look like in one's hospital and the surrounding area is enormously challenging. Many hospital executives had participated in the FEMA-sponsored hurricane simulation known as Hurricane Pam in 2004. All agreed that Hurricane Katrina had played out much as the simulation had projected. Still, as one executive told the authors, "You really can't picture what that amount of water looks like, and what it covers and makes inaccessible, until you see it." It didn't help that the Hurricane Pam exercise fell short in terms of specifying the details of response and recovery, and that a scheduled Return to Hurricane Pam did not materialize as planned in the summer of 2005. Without the ability to visualize the devastating effects of deep water, hospital executives could not imagine having to evacuate their facilities *completely* without access to surface transportation.

Patient Care in Crisis

The news media have communicated many personal stories of patient care in New Orleans hospitals immediately after Hurricane Katrina. Despite oppressive heat, lack of adequate food and water supplies, and lack of appropriate means for disposing of waste, hospital staff at 15 New Orleans hospitals worked tirelessly to maintain the physical, mental, and emotional health of their patients, their families, and themselves. Staff members manually operated ventilator equipment for respiratory patients for hours on end, shared personal stores of food and water, and carried patients up and down darkened stairwells to be evacuated. Clearly, the people in New Orleans hospitals were faced with the most perilous conditions. One person interviewed equated what he observed with what one might see in a war zone.

Communication in Peril

As the water rose inside and around Orleans Parish hospitals, most found themselves without the means to communicate adequately with the outside world. According to one hospital executive who spoke with the authors, "You've got to understand. Once the levees were breached, and once our power was gone, we had a complete lack of communication with the outside world. We had no real idea what was going on, not even across the street." Communication at hospitals inside the

hurricane/flood zone was impossible while, ironically, those outside the disaster zone could watch round-the-clock coverage on the television news.

Traditional means of communicating by telephone were unreliable. Land telephone lines were completely inoperable. Pay phones that weren't under water usually worked, but they were few in number. Some staff members' cellular telephones worked, at least in the beginning of the week, before the cellular towers ran out of auxiliary power. Likewise, the OnStar system in some staff members' vehicles worked. Though some facilities were equipped with satellite phones, one hospital executive conceded that their phones did not work. Ham radios were used by at least two hospitals to communicate with the outside world. Phillip Sowa, chief executive officer (CEO) of Meadowcrest Hospital, wrote, "at one point, we asked the husband of one of our employees, who had a portable ham radio, to send a "Mayday" alert from the roof of our hospital to anyone listening" (2005, para. 7).

For some hospitals, contact with the outside world was limited to reports from new arrivals; consequently, rumors of looting and shooting filled the halls of many hospitals, especially those located near the central business district. Even on the west bank of the city, untouched by flood waters, fear of looting increased the anxiety experienced by hospital staff and others sheltering at the hospitals.

Within the hospitals, as high-tech communication devices failed, hospitals resorted to lower tech, yet still effective, means of communicating with staff members. Staff members not directly involved in patient care, along with family members, carried messages throughout the darkened hospitals. Hospital executives described numerous face-to-face meetings and walking the corridors of their hospitals, all in an attempt to maintain personal contact with their staff members and to provide a measure of calm in the face of high anxiety. Despite these measures, more than one hospital executive told the authors that they were not sure they "did a good job helping their employees cope with stress." They tried to ensure that staff had adequate rest time, and they supported creative approaches to stress management such as offering multidenominational worship services by in-house chaplains. Still, the conditions faced were so extreme that there did not seem to be any "good mechanisms to help people deal with stress," according to one hospital executive interviewed by the authors.

The Decision to Evacuate

In the aftermath of the flood, hospital staff members worked diligently to evacuate critically ill patients. Patients on dialysis, patients on ventilators, and babies in the neonatal intensive care units were among the first to be transported. Their needs for electrical power and potable water pushed them to the top of the priority list.

Two questions needed to be addressed in order to make these evacuations happen. First, by what means could these patients be transported? Surface transportation was not a viable option for those hospitals surrounded by water. Second, to where could they be transported? Hospital staff members and administrators relied heavily on personal and professional relationships and networks of contacts to answer both questions.

Making the decision to evacuate everyone who sheltered at the hospitals during Hurricane Katrina was not easy. Evacuating a hospital under any circumstance is unusual (Chavez and Binder 1996; Vogt 1990; Sternberg, Lee, and Huard 2004), and detailed and comprehensive evacuation plans tend to be the exception, not the rule. In the past, New Orleans hospitals withstood many hurricanes. Staff members were accustomed to riding out storms, and helping their hospitals resume operations within days following those storms. Hence, they were not fully prepared for Hurricane Katrina and the subsequent flooding.

By Tuesday morning, August 30, the floodwaters had risen to dangerous levels around many of the hospitals. Worse, where emergency generators were located in flooded basements, staff found themselves without access to reliable and adequate power. Such was the situation at Charity Hospital, about which *The Houston Chronicle* reported:

> *By Tuesday morning, the hospital's basement was flooded, knocking out the generators, forcing staff to rely on 10 portable diesel-powered generators and a few Vortran oxygen-powered ventilators procured only a week before the storm . . . By Tuesday night, . . . patients needing dialysis had not received it for two days and were getting sicker. The bathrooms were foul and overflowing. It was stiflingly hot. The patients were uncomfortable. Diesel for the portable generators, liquid gold, was running low (Freemantle 2005, para. 15, 18).*

In short order, the situation in many hospitals was becoming untenable. Without reliable power, without knowing how long city power would be out, and without knowing how long it would be before a supplier could deliver additional diesel fuel, hospital administrators and staff were forced to consider the notion that their ability to deliver quality healthcare was becoming severely compromised (Sowa 2005). Reliable power is prerequisite to the functioning of equipment that enables effective modern medicine and to the air conditioning that keeps people cool and mold under control. Potable water, like power, is prerequisite to the functioning of modern medical equipment, to sanitation, and to keeping hospital staff and patients hydrated. Ironically, while the hospitals were surrounded by water, they did not have enough water to function.

While the severity of conditions varied from location to location, in the end all hospitals that evacuated did so for similar reasons. First, their physical plants were degrading rapidly and dangerously. At more than one hospital, emergency generators failed, damaged by either the hurricane or the flooding. Still others ran out of fuel. Without power, staff had to transport patients up and down darkened hallways and stairs.

At least two hospitals possessed dedicated potable water supplies, thanks to on-site wells. The others depended on the city's water supply. When it became unavailable, staff struggled to establish sanitation regimens that could be respected by everyone. Staff members designated toilets for fluids only, or used red biohazard bags draped inside toilets to collect waste. Still, some people broke the new sanitation rules. Staff members persisted in their attempts to enforce the new rules, knowing that improper sanitation can be deadly, especially for immune-compromised patients.

Hospital executives and staff grew increasingly anxious about the growing civil unrest in the city. Looting was widespread. There were stories of addicts trying to break into pharmacies to steal narcotics. Yet, the threat of crime alone would not have been enough to increase the anxiety of hospital staff members. After all, New Orleans had one of the highest crime rates in the United States. According to an FBI Report of Offenses Known to Law Enforcement (2003), New Orleans' murder rate was 7.5 times the national rate and New Orleanians endured higher than national rates of many violent crimes.

What staff members were not prepared for was a growing awareness of isolation and a need to defend themselves and their patients against more than illness and disease. Hospitals lacking adequate security and visible police or military presence were certainly more vulnerable to crime.

With their world falling apart, hospitals were forced to alter their self-perceptions. No longer able to play their preferred role of responder, they were compelled to join the ranks of those needing rescue. This observation is not intended to suggest that hospital staff members were less heroic, less passionate, or less competent than they had been before Hurricane Katrina. Simply put, they were stripped by the hurricane and subsequent flooding of the tools they needed to play their usual and more comfortable role.

Once hospital executives conceded that they must evacuate everyone from their facilities, they began planning to make it happen. What might seem to be a straightforward decision task was in fact extremely complex. Wanting to evacuate immediately, and being *able* to evacuate within even the next 48 hours were not the same. Complete evacuation would take much longer.

The hospital executives interviewed said that they had discussed previously what it would mean to evacuate their hospitals, at least in general terms. Some had pre-arranged contracts with ambulance companies, bus companies, and van companies to transport patients and staff in the event of a disaster. Others did not have pre-arranged contracts, but were able to secure verbal agreements for transportation assistance once a disaster was underway. In all likelihood, the same limited number of transportation providers (e.g., Acadian Ambulance) had formal and informal agreements with many hospitals, nursing homes, and other facilities. With a disaster as widespread as Hurricane Katrina, such a system of individually negotiated contracts was destined to collapse.

An important factor that interfered with the timely evacuation of the hospitals, one that hospital executives (and perhaps everyone) did not anticipate, was the entire community's need for helicopter and other flood-resistant surface transportation (e.g., trucks with high ground clearance). All helicopters were pressed into duty, retrieving flood victims from attics and roofs. The number of victims was astronomical: tens of thousands of people were trapped above the floodwaters without access to surface transportation, without food and water, and under the heat of a blazing sun. Rescuing these individuals was clearly top priority.

Clearly, most of the hospitals did not expect to ever evacuate completely. Certainly most did not expect to evacuate completely by air. The loss of surface transportation in the immediate surroundings of these hospitals had a truly crippling effect. Most of the hospitals had only a few boats on their premises. Several did not have helipads. While some might wonder why the hospitals did not plan to evacuate completely by air, the answer lies in staff members' well-informed perceptions that moving critically ill patients by helicopter and by boat is more risky than moving those patients by ambulance.

The New Orleans *Times-Picayune* estimated on August 31 that 1,600 patients and 8,600 staff members and their families awaited rescue (Moller 2005). Eventually all hospitals were completely evacuated, and stranded patients and hospital staff were driven or flown to elevated sections of interstate I-10, a temporary staging area, or directly to the Louis Armstrong Airport for transportation out of the city. Hundreds of patients, many gravely ill, waited for hours in the airport at emergency medical facilities. Once they were loaded onto planes, their destinations were hospitals located all over the southern part of the United States—hospitals in Alabama, Arizona, Georgia, Louisiana, Missouri, South Carolina, Tennessee, and especially Texas. While some patients were sent to particular hospitals thanks to previously arranged transfers, others were sent to whichever hospital was the destination for a given plane. As one hospital executive lamented to the authors:

We were under the impression that there were three or four strategic hospitals in the state where they (the patients) were being flown to. In reality, after waiting in the airport for many hours, our patients were flown out of state. . . . for weeks after, we had family members calling us, looking for particular patients. But we had no real information. . . . We assumed that all of this was being coordinated somehow, but it was not.

Hospital Profiles: Post–Hurricane Katrina and the Flooding

As stated earlier, the authors observed in person 12 of the New Orleans area's 15 acute care hospitals. The following narrative describes the condition of those hospitals at the time of the authors' visit, in early October 2005. Of the seven hospitals that remain closed as of July 2006, several seem unlikely to reopen ever, based on the amount of hurricane and flooding damage observed, and based on statements from hospital executives. Chalmette Medical Center, for example, was physically decimated. Hurricane Katrina's 125 mph winds tore at its roof. Storm surge from the Intercoastal Waterway and floodwaters from the overtopped Industrial Canal levee swamped its first floor with 12 feet of brackish and oily water. Figures 4 and 5 illustrate the extent of the damage sustained by the Chalmette Medical Center.

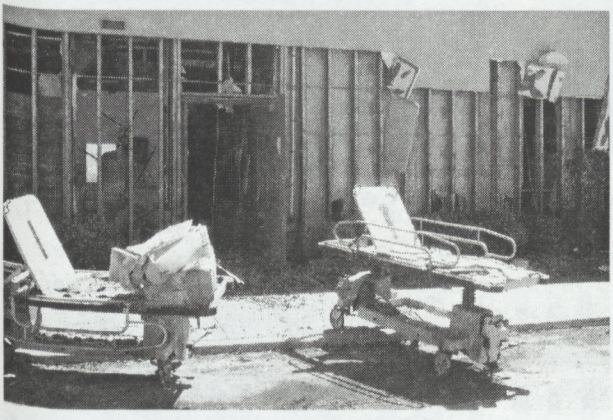


FIGURE 4: Destroyed Dryvit Walls at Chalmette Medical Center

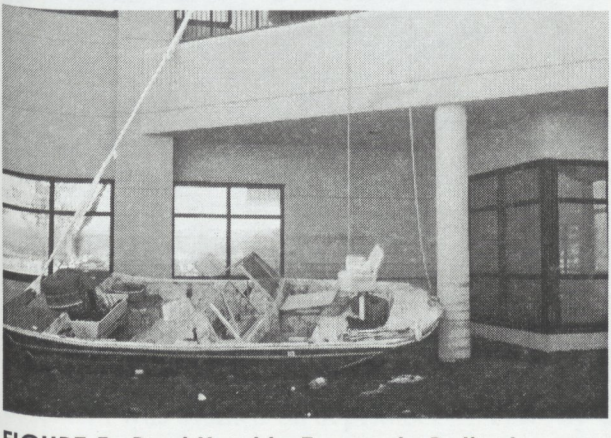


FIGURE 5: Boat Used to Evacuate Patients from 2nd Floor at Chalmette Medical Center

This hospital's buildings and their contents appeared to be the most severely damaged of all New Orleans area hospitals by both the hurricane and subsequent major flooding. Besides high water marks on all exterior walls (reach-

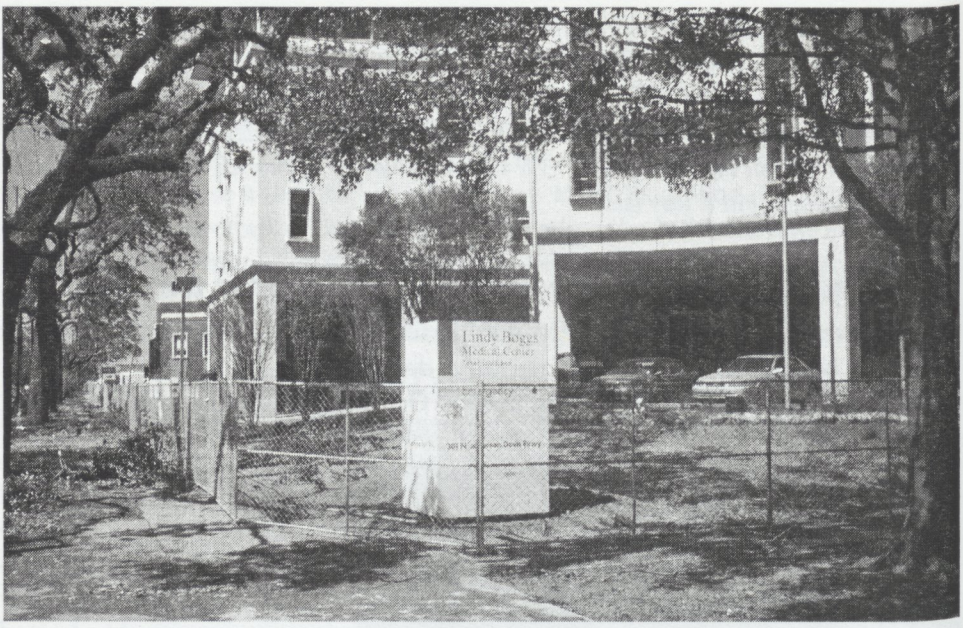


FIGURE 6: Damage at Lindy Boggs Medical Center, now surrounded by a chain-link fence



FIGURE 7: Charity Hospital

ing more than 10 feet from street level), the adjacent landscape and hardscape were covered with 1–2 inches of a sludge-like deposit. Extensive mold damage was evident. Exterior dryvit walls had been significantly destroyed, exposing the broken and contaminated contents within.

Like the devastated parish in which it resides, the future of the Chalmette Medical Center seems uncertain at best. As was the case in the Lower Ninth Ward of neighboring Orleans Parish, St. Bernard Parish absorbed the worst of the hurricane and flood damage. Located well below sea level, the area is most likely to flood, to flood deeply, and to flood often (Barry 1997). Rebuilding any facility, especially a multimillion dollar facility like a hospital, is a risky proposition in such a location. As recently as July 8, 2006, the Universal Health Services website reported that:

> Chalmette Medical Center remains closed due to the extreme damages sustained during Hurricane Katrina. While there is no timetable at this point for reopening the facility, we will continue to evaluate the situation with the hope of making a final determination soon (Chalmette Medical Center 2006, para. 1).

At Lindy Boggs Medical Center, no remediation appeared to be underway in early October. Like Chalmette Medical Center, Lindy Boggs Medical Center sustained significant flooding damage. Staff members onsite during Hurricane Katrina indicated that the surrounding neighborhood had flooded quickly. Besides high water marks on all exterior walls (reaching at least five feet from street level), the adjacent surface parking lot contained approximately 100 flooded vehicles. The basement and first floor sustained the majority of direct flooding damage. Figure 6 illustrates the extent of the damage sustained by the Lindy Boggs Medical Center.

The Medical Center of Louisiana at New Orleans, which includes both Charity Hospital and University Hospital, is administered by the Health Care Services Division of Louisiana State University (LSU). "Big Charity" is a public hospital and Level 1 trauma center that accepts indigent cases and those without medical insurance.

Well-publicized news reports have suggested that both Charity Hospital and University Hospital are unlikely to reopen, at least in their previous locations, due to extensive flooding damage to the basements and first floors. A team of structural engineers who led a media tour of Charity Hospital on October 5, 2005, reported that the water that flooded Charity's basement had likely reached the now-destroyed ceilings or higher (Government Accountability Office 2006). Although the basement was drained on September 14, 2005, by then virtually all of the stored medical records and research specimens were rendered unsalvageable by the

floodwaters. Also irrevocably damaged were the electrical and mechanical systems that were located in Charity's basement.

Figure 7 illustrates the extent of the damage sustained by Charity Hospital. No obvious remediation efforts were underway in early October, in contrast to extensive remediation efforts underway at Tulane University Hospital, across the street from Charity Hospital. Donald Smithburg, CEO of LSU's Health Care Services Division, reported:

> Both hospitals were damaged and are closed. For Charity's landmark building, which opened in 1939, the storm was a death knell. For decades it has been recognized that Charity needs to be replaced. The building has needed upgrading, and the storm completely wrecked the electrical system (*USA Today* 2005, para. 21).

According to Smithburg, LSU was developing plans to replace the aging and deteriorating Charity facility before Hurricane Katrina struck (Alpert 2005). Smithburg reports that it is too soon to know whether either building can be used again for medical care: "it's highly unlikely Charity would be reusable without hundreds of millions of dollars in renovations" (*USA Today* 2005, para. 23). LSU contracted with Adams Consulting to develop estimates for repairing and replacing both Charity and University Hospitals. According to Adams Consulting, the cost of repairing the hospitals would be $257.7 million for Charity Hospital and $117.4 million for University Hospital. The cost of replacing the hospitals would be $395.4 million for Charity Hospital and $171.7 million for University Hospital (Government Accountability Office 2006).

At Memorial Medical Center, basic remediation and environmental assessment were underway in early October. Visual inspection of the building housing the hospital's emergency department (ED) revealed widespread water damage from at least six feet of flooding. Personnel onsite confirmed our observations, and commented on mold and other damage that occurred when water service was restored to the facility.

Approximately 20 percent of the windows in the ED building appeared to have been broken, though not necessarily because of hurricane damage. Instead, many of the windows were broken apparently by staff who remained with patients after the power went off, in order to ventilate the otherwise sweltering building. As was the case at its sister campus, Lindy Boggs Medical Center, Memorial was protected by a chain link fence that surrounded the entire facility. Unlike the quiet that blanketed Lindy Boggs, however, Memorial was abuzz with activity, as personnel in HAZMAT suits prepared to examine the building and security personnel ensured that no one approached.

According to the New Orleans *Times-Picayune* (Darcé 2005), Memorial's owner, Tenet Healthcare Corporation, reports that the structural damage is sufficient to warrant tearing down the hospital and replacing it with a $200 million facility. One proposal recommends demolishing the eight-story hospital building and building a new 200-bed facility. The cost of a new facility would be about $1 million for each patient bed.

Adding to the woes associated with rehabilitating the facility have been reports and accusations that staff members at Memorial Hospital euthanized some patients (Anderson 2005; Johnston 2005; Roig-Franzia and Connolly 2005). The likelihood is low that anyone will be able to determine with certainty the cause of death of the 45 people found in Memorial Hospital post-Katrina. Nonetheless, the tragic situation at Memorial Hospital has fueled debate about euthanasia and the decisions of medical staff members faced with uncertainty amid increasingly desperate and deteriorating conditions.

Methodist Hospital, located to the east of the London Avenue Canal levee breach, sustained both hurricane and flooding damage. Basic remediation and environmental assessment were underway in early October. The difference in the activity level during site visits between this facility and the other one owned by Universal Health Services (UHS), Chalmette Medical Center, was striking. Visual inspection of the main building housing the ED indicated that approximately four feet of water surrounded the building, causing flooding in both the basement and on the first floor. Remediation teams in HAZMAT suits were busy removing damaged equipment, furniture, and supplies. Security personnel had established a visible presence. As recently as July 8, 2006, the UHS website reported that:

> Methodist Hospital remains closed due to the extreme damages sustained during Hurricane Katrina. While there is no timetable at this point for reopening the facility, the Methodist Administration, along with UHS, continues to be actively engaged in discussions with local officials to assess the ongoing healthcare needs of the community. We are making every effort to ensure that future healthcare needs for the New Orleans East community are met (Methodist Hospital 2006, para. 1).

Clearly, the issue of whether to reopen a hospital facility in the New Orleans area will depend not only on the cost of rebuilding or rehabilitating, but also on the projected residential population. East New Orleans, like St. Bernard Parish, was extremely hard hit by Hurricane Katrina and the subsequent flooding, and estimates vary widely as to the likely number of residents who will return and rebuild their homes and lives.

Tulane University Hospital, like its close neighbor Charity Hospital, sustained extensive flooding damage. Both hospitals received media attention in the days following Hurricane Katrina, in large part because Tulane's owner, Hospital Corporation of America (HCA), successfully arranged for helicopter evacuations of its patients and staff. In the meantime, Charity Hospital appeared forgotten (Rohde, McNeil, Abelson, and Dewan 2005). Some speculated that Charity had been forgotten because it served the poorest of the poor. Without question, Charity's staff and patients did not benefit directly from an externally coordinated evacuation effort. While privately owned Tulane University Hospital was evacuated in an orderly fashion, publicly owned Charity Hospital patients and staff were forced to wait. As a result, Charity Hospital became a lightning rod for conversations about race and inequity in the United States. In the end, many patients and staff members from Charity Hospital were evacuated from Tulane's parking garage.

In October, extensive remediation at Tulane Hospital was underway, including demolition, removal, and drying of sheet rock and other materials from the first floor of the main hospital building that had been damaged by water. There appeared to be little damage at the second floor or above. Personnel onsite indicated that no major equipment or emergency generators had been damaged by the flood, because they were located above the flood line. Some limited window breakage was evident on the upper floors of the main hospital building. Air remediation efforts were underway in one of the garage facilities that had flooded. Before reopening its main facility on February 14, 2006, Tulane University Hospital had opened a small walk-in, primary-care clinic on the ground floor of this garage facility as of late November 2005.

Veterans Administration (VA) Hospital is located in the central business district of New Orleans along with Charity and University hospitals, and Tulane University Hospital. Armed security personnel onsite during the first part of October prevented close examination of the hospital building for hurricane or flooding damage. Instead, the authors' assessment of the VA Hospital is based on November 10, 2005, testimony from R. James Nicholson, Secretary of Veterans Affairs, before the Senate Committee on Veterans' Affairs:

> The VA facility initially weathered the hurricane with minimal damage. Following the hurricane, water from the breached levees flooded the entire area around the medical center, including the basement and sub-basement of the main building. These areas house the facility's major electrical, mechanical, and dietetics equipment. . . . A major cost of restoring the facility to operational status will include those costs incurred from damage to equipment and interior finishes. . . . We are taking steps to mitigate the damage caused by flooding, humidity, heat, mold, and mildew. Efforts are

> underway to restore power, water, limited climate control systems, elevators, and safety systems (Nicholson 2005, para. 7, 8).

While the VA Hospital sustained major hurricane and flooding damage, remediation efforts have been in full swing. The likely consequence will be a return of the VA Hospital to New Orleans in relatively short order.

Two of the Orleans Parish hospitals visited by the authors reopened within six weeks of Hurricane Katrina. Children's Hospital, located on relatively higher ground in uptown New Orleans near the Mississippi River, sustained no structural damage. Only a handful of windows were broken by the hurricane. Relatively minor remediation efforts were underway in early October to address mold growth in an auditorium caused by condensation and lack of air conditioning. The building exterior appeared untouched by either hurricane or flooding, as shown in Figure 8. In fact, floodwaters did not reach the hospital's property. Contrary to fears and rumors at the time, looters and vandals did not enter the facility.

While the hospital was undamaged, it was closed immediately after Hurricane Katrina and the subsequent flooding. Professional security was contracted to provide a round-the-clock presence to discourage criminal activity, protect the physical plant, maintain the safety of those individuals involved in the hospital's clean up, and control the flow of people in and out of the hospital.

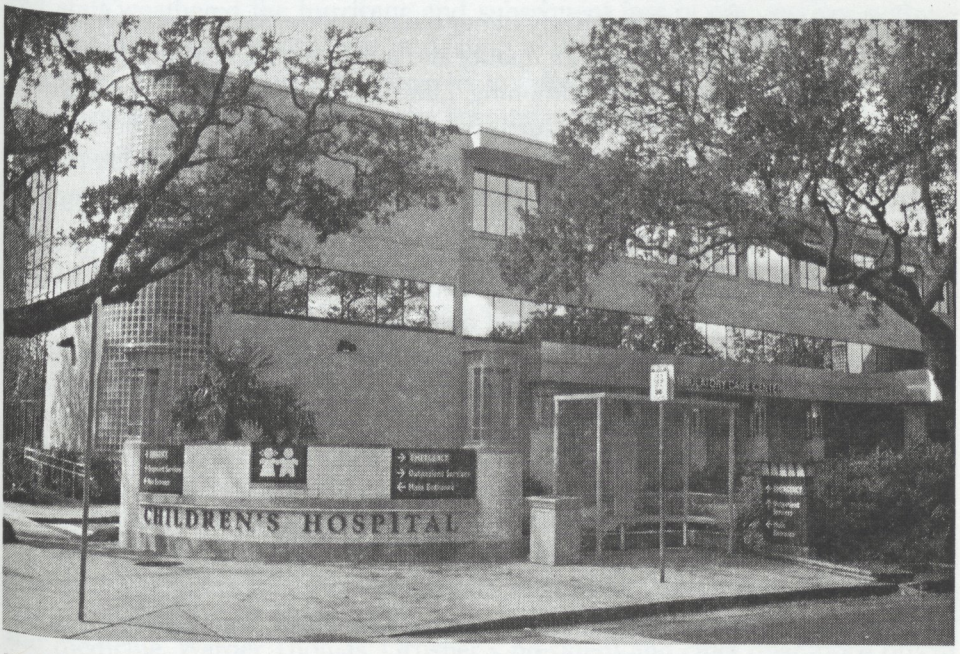


FIGURE 8: Children's Hospital



FIGURE 9: DMAT Tent outside Emergency Department at Touro Infirmary

Located in the Garden District of uptown New Orleans, Touro Infirmary suffered limited hurricane damage. Relatively minor remediation efforts were underway in early October to enhance overall air quality and to address mold growth caused by condensation and lack of air conditioning. Like Children's Hospital, Touro's exteriors appeared untouched by the hurricane, as seen in Figure 9, and floodwaters did not reach the hospital's property. Still, thousands of ceiling tiles were ruined, and some furniture, equipment, and supplies were destroyed by mold.

Like Children's Hospital, Touro Infirmary was closed immediately after Hurricane Katrina and the subsequent flooding. Touro's emergency department reopened on September 28, 2005. The full hospital reopened two weeks later. In addition to the hospital services offered by Touro upon its reopening, a Disaster Medical Assistance Team (DMAT) was established in tents outside the ED. Its responsibility was to triage patients presenting to the ED, and administer immunizations to the public.

Both Children's Hospital and Touro Infirmary were closed in response to the mayor's mandatory evacuation order (Russell 2005), degradation of their physical plant (failure of emergency generators, lack of elevators, lack of lighting, failure of the city water system, degradation of sanitary conditions, high heat and humidity), and growing civil unrest.

Three New Orleans area hospitals never closed. East Jefferson General Hospital (EJGH), located in Jefferson Parish, stayed open throughout Hurricane Katrina and afterward. It was one of only three hospitals in the New Orleans area, along with West Jefferson Medical Center and Ochsner Clinic Foundation (renamed Ochsner Medical Center in 2006), to have remained operational during and after Katrina and the subsequent flooding. Visual inspection revealed that EJGH's primary hospital building exteriors were untouched by either hurricane or flooding. No structural damage was evident. While the streets around EJGH flooded, the hospital itself was on elevated ground, and was not inundated.

Since the hospital did not close, and since it was not damaged by the hurricane or subsequent flooding, it did not require evacuation. Instead, the hospital served as a shelter for approximately 4,000 people during the hurricane and immediately after, including patients, hospital staff and many of their family members, National Guardsmen, members of various local government agencies, and other citizens. Besides serving the individuals sheltered at the hospital, EJGH staff members also coordinated emergency medical services among the three hospitals that remained operational during the disaster. To that end, East Jefferson staff members worked with urban research and rescue (USAR) teams to evacuate and triage tens of thousands of evacuees.

Emergency planning appears to have worked well, as the hospital and its patients and staff weathered the hurricane and subsequent loss of city services without incident. The hospital's success in dealing with the disaster may be attributed, at least in part, to its prior investments in self-sufficiency. For example, besides having backup generators onsite, the hospital also has its own well that provided potable water.

Like EJGH, Ochsner Clinic Foundation is located in Jefferson Parish, directly adjacent to Orleans Parish. Ochsner stayed open during and after Hurricane Katrina, and incurred limited hurricane damage as storm water penetrated the facility through a roof leak and windows were blown out by the wind (see Figure 10). Though surrounding streets filled with water, the hospital did not flood. Conversations with hospital staff revealed that a lack of city power was complicated by some failures in the hospital's emergency power supply. The result was stifling heat and condensation. Fortunately for Ochsner, the lack of city water did not affect its plumbing and sanitation systems, because they also maintain an onsite well.

Like EJGH and West Jefferson Medical Center, Ochsner Clinic Foundation possessed the benefit of both geographical location vis-à-vis Orleans Parish and sufficient opportunity to secure additional resources such as equipment, supplies, and medicine. Warner Thomas, Ochsner's president and chief operations officer



FIGURE 10: Ochsner Clinic Foundation

(COO), reported that "Ochsner's positive outcome after the storm was due 50 percent to our location on the 'lip of the bowl' of the city, and another 50 percent to very solid strategic planning and preparation that allowed us to be flexible and adapt to the changing situations during and after the storm" (2005, para. 1).

Finally, located on the west bank of the Mississippi River in Jefferson Parish, West Jefferson Medical Center (West Jeff) also remained open during Hurricane Katrina and stayed open. The facility incurred limited damage from the hurricane, including some window breakage and relatively minor exterior damage.

West Jefferson Medical Center did not evacuate during Hurricane Katrina or subsequently. Back-up generators provided power. Onsite were approximately 2,500 individuals, including hospital patients, critical needs patients and their caregivers, staff members, family members of staff, and emergency workers. Like EJGH and Ochsner Clinic Foundation, West Jeff's extensive emergency plans appear to have worked well, as the hospital and its patients and staff weathered the hurricane and subsequent loss of city services without incident. The hospital's success may be attributed also to the experience of its staff with hurricanes and other disasters. Updates were published in a daily in-hospital newsletter, thereby providing a tangible means of helping people cope with the extreme conditions. A major component of West Jeff's success appears to have been the extensive personal and

professional contacts of its staff members. No matter their needs, West Jeff staff members drew on a long list of people and organizations in their networks.

Lessons Learned from New Orleans' Double Disaster

Hurricane Katrina and the subsequent flooding of New Orleans provided many lessons for emergency planners and decision makers, including all those who work in government, for-profit, public, and nonprofit organizations. A primary lesson is that emergency plans in multi-hazard locations need to go beyond planning in one-disaster-at-a-time mode. A corollary and specific lesson for hospital organizations, reinforced more than learned, is that hospitals are interdependent with their community. Thus, a healthy New Orleans needs and will continue to need well functioning hospitals, and well functioning hospitals need and will continue to need a healthy New Orleans. The remainder of this section focuses on seven lessons in support of these two key themes. While many of the lessons may transcend hospital organizations, and may apply to other types of organizations, decision makers are encouraged to consider the specific elements of their particular organizational setting. Similarly, while many of the lessons may apply to planning for disasters other than hurricanes followed by flooding, decision makers are encouraged to consider the events and combinations of events most likely to affect a particular organization.

Constructing Resilient Building Systems

Lesson: Hospitals should have their own power and water supplies independent of municipal utilities. Hospitals should minimize their reliance on city power and water supplies when disaster strikes. With respect to emergency generators, at least two practices seem important. First, hospitals should have onsite generators with enough emergency capacity to power all of their essential equipment. In New Orleans' hot and humid climate, air conditioning is essential equipment. Likewise, any multistory hospital should consider having at least one elevator connected to its emergency power supply. Second, to the extent that the hospital's physical plant permits, emergency generators should be located higher than the first floor, and in a building unlikely to sustain wind damage from storms.

In the midst of catastrophic flooding, New Orleans hospital executives learned valuable lessons about potable water. Two hospitals, East Jefferson General Hospital and Ochsner Clinic Foundation, were able to maintain critical medical equipment that relied on potable water using their onsite wells. Neither hospital had compromised sanitation. Everyone who sheltered at the hospital was able to stay hydrated despite the oppressive heat. Hospitals with sufficient financial resources and a suitable physical plant should consider digging onsite wells that can be

attached to backup emergency power. Otherwise, hospitals should consider various methods for storing bulk water, if not for drinking, at least for flushing toilets. At minimum, hospitals should transfer before any major hurricane all dialysis and other patients whose treatment relies on potable water.

Expecting to Be Self-Sufficient

Lesson: Hospitals should expect to be on their own in the event of an emergency. Hospitals should plan to be self-sufficient for an extended period. Currently, hospital emergency plans assume a minimum period of self-sufficiency, usually 72 hours. In the aftermath of Hurricane Katrina, however, many hospitals found that they had underestimated the supplies needed. At some hospitals, supplies stored in lower levels were destroyed by flooding. Others simply ran out of what they needed—primarily food, water, and portable fans. Some hospitals dispatched staff members to nearby food and discount stores to secure needed supplies, often at the store's invitation. One hospital executive said that in the future he would be certain that his hospital could be self-sufficient for two weeks. The two-week period was mentioned by nearly all interviewees, and seems reasonable, at least with respect to the hospital's most critical needs, to include generator fuel, water, food, and medicine.

Besides stockpiling needed supplies, hospitals should plan to rescue themselves without relying on government entities or relief organizations for help. Especially when a catastrophe of Hurricane Katrina's magnitude strikes, the resources needed to evacuate one hospital, much less several hospitals simultaneously, are likely unavailable. Hospitals should plan to execute their own evacuation, complete with necessary transportation equipment—automobile, truck, boat, or helicopter. Hoping that the Coast Guard, FEMA, or someone else will appear with the specialized equipment necessary to evacuate critically ill patients suggests a lack of comprehensive planning. The hospitals that successfully orchestrated their own evacuations, Tulane University Hospital among them, had made arrangements in advance based on prior disaster experience.

Networking

Lesson: Hospital staff members should build strong networks with local, regional, state, and national sources of assistance (both governmental and private). Effective organizations establish multiple contact points with people and organizations in external environments (Aldrich 1979). The most effective organizations allocate time and resources to building personal, professional, and organizational relationships so that in times of need, those contacts may be called upon for assistance. Never was the importance of such relationships more aptly demonstrated than in the days following Hurricane Katrina.

To the extent possible—and given breakdowns in communication networks—staff members were asked to access personal and professional networks and contact anyone and everyone they knew on the outside to get the message out that their hospital was in trouble and needed help. Staff members reached out to virtually any person or group who might be able to supply information, food, water, medicine, other supplies, equipment, protection, or transportation. Staff members even worked to communicate their hospital's plight to people they didn't know via the Internet and the news media.

Approach networking from the other side of the relationship, it seemed that hospitals with many external contacts were also more likely to be approached by external contacts with offers of assistance. In other words, the more well-connected the hospital via its staff members' network of contacts, the more likely that someone from the outside would inquire about the hospital and take steps needed to help.

Staffing

Lesson: Hospitals should continue to hire the best staff members and be certain that those staff members are onsite when needed. Hospital emergency management plans specify which staff members are essential and must report to work in the event of a disaster. Nonessential staff members are usually instructed to evacuate the city when an evacuation warning is given. Essential staff members are divided into an "A Team" and a "B Team." The A Team reports to a hospital before an expected storm, while the B Team relieves the A Team a short while later. Individuals who work at New Orleans hospitals know what to do when they hear on the local radio or TV station that a hurricane is expected to make landfall. Pages and telephone calls to essential staff members reinforce what they hear on the local news.

Fortunately, most A Team members responded to their pages and telephone calls before Hurricane Katrina as required. Most evacuated their families and pets, and reported to work by Sunday morning. Of course, some essential staff members did not report to work. Still other staff members brought family members and pets to the hospital, perhaps out of concern that their family members and pets would be unable to evacuate.

Most New Orleans hospitals sheltered a significant number of staff family members during Hurricane Katrina and immediately thereafter. Clearly, having additional people onsite added stress to the hospital system, its staff, and its patients. While most emergency management plans specified that people should bring enough food, water, and other supplies for their family members, most people underestimated the length of their stay and failed to bring sufficient emergency provisions. With so many people onsite, hospitals found themselves running low on everything: food, water, over-the-counter medicines, bedding, and patience.

The hospitals in the worst situations were those whose food and potable water supplies were located on lower floors that flooded.

Some family members with little to occupy themselves took to wandering halls. In at least one hospital, staff members complained that family members hovered around the incident command center. Certainly, some family members were helpful to the emergency effort. Family members served as message runners and helped in myriad ways, including delivery of patient care that didn't require medical expertise, pet care, childcare, laundry, and so on. Overall, though, most hospital executives agreed that the situation would have been less stressful had family members not been present.

Given that perception, one might wonder why family members were permitted to shelter at the hospitals at all. The answer is straightforward: Hospital executives believe that a critical number of essential A Team staff members might not report to work if they could not bring their family members. Which scenario is worse: not enough essential staff members, or too many family members? Hospital executives wanting to ensure sufficient staff resources unaccompanied by family members might want to consider assisting family members with evacuation and offsite sheltering.

Besides the large number of nonstaff members onsite, hospitals had an additional staffing problem. Over the span of nearly a week, many hospital staff members worked an extraordinary number of hours with few breaks. While members of the relief or B Team are expected to relieve A Team members within a couple of days of a hurricane, in New Orleans hospitals after Hurricane Katrina, some people on the B Teams were never heard from, or were unable to make it into work. Some hospital executives told us that they would rethink their A Team vs. B Team assignments, to include stronger B Team members (e.g., more loyal, more competent, more creative), since B Team members might need to overcome substantial adversity to reach the hospital after an extreme event.

Communicating Emergency Plans before Disaster Strikes

Lesson: Hospitals should plan for the worst and be certain that all staff members know their role in an emergency. Everyone likely to play a decision-making role in the aftermath of a community disaster should receive hands-on training in disaster management. Communication breakdowns in the aftermath of an extreme event, such as those observed after Hurricane Katrina, are more likely to occur when key individuals do not share a common and extensive background in disaster training. Unfortunately, it seems that not all relevant officials in the New Orleans area participated in such training before Hurricane Katrina.

Most, if not all, Louisiana hospitals use some version of Health Resources and Services Administration's (HRSA) Hospital Emergency Incident Command System that establishes a hierarchy of reporting relationships and creates an incident command center. Its primary function is to physically co-locate key decision makers and computers and communications equipment.

From a review of planning for and establishing incident command centers (ICCs), several recommendations emerged from conversations with hospital executives. First, all agreed that ICC access should be limited to essential personnel only. Second, several suggested that there were too many people staffing their ICCs during the day, and not enough at night. Finally, several agreed that having a pre-established ICC with all necessary furniture and equipment would be more effective than trying to establish an ICC in the midst of an emergency. Importantly, having such a setup may prove cost-prohibitive for many hospitals. Still, while the costs to maintain a permanent ICC might outweigh the benefits, the authors' discussions with hospital administrators suggest that there is great value in exercises for quickly setting up and operating an ICC.

When asked who had been responsible for developing and testing their hospital's emergency management plan, most hospital executives listed members of the top management team, unit leaders, and other emergency management personnel (e.g., risk management staff). Seldom mentioned were individuals occupying nonmanagement positions, despite the fact that many of those individuals are essential staff expected to report to work in an emergency. Of course, anyone living in New Orleans for any length of time has experienced a hurricane. Still, personal experience with a disaster is thin preparation for working a disaster as part of a complex team of medical professionals.

Actual practice or enactive mastery is the gold standard for learning to do something well and feeling confident about one's ability to perform effectively that same something in the future (Bandura 1997). To that end, hospital staff members should have the opportunity to physically practice what will happen in an emergency. Tabletop exercises, where personnel talk through protocols and decision making during a hypothetical extreme event, often reveal unresolved linkages. Unfortunately, tabletop exercises typically involve few management personnel. So, while management personnel are able to learn a great deal about their organization's potential response to a disaster, most hospital staff members are forced to wait for the real thing before practicing what to do. Involving more staff members in experiential disaster training would likely yield reduced stress for them, as they developed more realistic expectations about what it would mean to be trapped in a hospital without air conditioning and without adequate supplies.

Experiential disaster training may have highlighted also the need for extensive and sometimes nontraditional communication both within and external to the hospital. Hands-on practice with a range of staff members may have revealed the widespread damage to communication systems associated with a continuing power outage. Knowing the likely communication challenges, more hospitals may have established tighter connections to local government and others immediately preceding Hurricane Katrina.

Experiential disaster training involving individuals not employed by the hospitals (e.g., rescue personnel) may have revealed that while several New Orleans area hospitals had changed their names within the last few years and months, maps and long-time residents tended to use the former names. Lindy Boggs Medical Center, for example, is widely known as Mercy Hospital. Its sister facility, now called Memorial Hospital, is widely known as Baptist Hospital. That some rescue personnel were delayed as they tried to figure out where certain hospitals were located seems certain.

Whether any of these issues could have been anticipated by experiential disaster training is speculative. Nonetheless, the literature on brainstorming (e.g., Amabile 1996) suggests strongly that involving multiple participants from diverse backgrounds is key to first identifying problems and then generating multiple workable solutions.

Communicating after Disaster Strikes

Lesson: Hospitals should anticipate communication breakdowns within their facilities, and with the outside world. Communication technology has reached a stage where many people cannot imagine life without their landlines and cell phones, their personal computers with Internet access, their personal digital assistants (PDAs), and so on. In the case of a disaster like Hurricane Katrina and the subsequent flooding, the loss of electrical power throughout the city eliminated or severely reduced the capability of these usual communication tools. The result was a near-total lack of communication between the hospitals and the outside world, and a significant reduction in the frequency and richness of the communication within the hospitals.

Clearly, hospitals should identify alternative means for communicating effectively in times of crisis. Each hospital facility should have at least one working satellite phone (or the equivalent) in each major section of the hospital. Several staff members, not just administrators, should know the location of the phones, and how to operate them. Likewise, each hospital facility should have at least one working pay phone in each major section of the hospital. Proper change should be kept in close proximity to each pay phone, to be used in case of emergency.

When determining and listing the staff members who will be considered essential and required to report in case of a disaster, hospitals should identify also whether the staff members have ham radios, cell phones, or vehicles with an OnStar navigation and communication system. Again, ensuring that a wide array of individuals know how to use communication equipment will be essential to its fulfilling its function in an emergency.

Perhaps the best way to ensure continuing communication within hospital facilities is to train and reinforce staff members on the means for communicating without using technology, especially technology that minimizes personal contact (e.g., e-mail). That is, in addition to using telephones and personal computers for communicating within hospitals, individuals should be encouraged and given regular opportunities to meet and communicate face-to-face. Doing so should facilitate breaking down some of the barriers that are typically erected between departments that are not physically co-located. The loss of communication efficiency should be offset by the relatively greater ease of communicating when technology is unavailable or unreliable.

While the findings of this research and the recommendations offered here consider how each hospital in a region functions in isolation, there is an important role for *regional* emergency coordination during an extreme event. If such a function was in place in New Orleans, it broke down when traditional communication methods failed during the flood. While each hospital in a region should establish an onsite ICC, the public health department or other municipal agency could be responsible for establishing a *master* ICC. The master ICC would interact with ICCs at individual hospitals, emergency services, municipal agencies and government leaders, ambulance and bus companies and have backup communication systems at the ready. The objective would be to coordinate among multiple healthcare facilities by overseeing emergency services, planning patient transfers, and deploying equipment and emergency workers where they are most needed.

Leading Effectively

Lesson: Having planned for the worst, hospital executives should be poised to lead. Most hospital executives had lived in either New Orleans or the southern part of the United States for several years, and all reported that they had some type of disaster experience. Those with the most disaster experience, especially hurricane experience, seemed to be the best prepared for and most confident in confronting Hurricane Katrina and the subsequent flooding. These individuals seemed to be best equipped for what their staff members needed them to do: lead.

One hospital executive listed no fewer than four major natural disasters that he had lived through while serving as a hospital executive. His disaster experience

adequately prepared him for Hurricane Katrina and the flood. He knew that he needed to take charge of the hospital's evacuation, and that he should not count on government assistance. He knew also that he needed to secure remaining narcotics and medicines in unmarked rooms in the hospital's highest floors before leaving the building. He reassured his staff that everything was unfolding as he had previously experienced, thereby reducing their stress.

To the extent possible, then, hospitals should make sure that their top management hires have some relevant disaster or crisis management experience. Further, top management should understand that a key component of their job will involve finding ways to help their staff members cope with stress, so that they can do the lifesaving and preserving work required of hospital staff members.

Hospital executives appeared surprised by the magnitude of the double disaster that struck New Orleans. Importantly, not everyone was equally surprised, and not everyone in essentially the same positions fared as well (or as poorly). There were differences in reaction not traceable to the physical damage inflicted on the various hospital facilities. Those differences had much to do with both planning and action around the topics of constructing resilient building systems, expecting to be self-sufficient, networking, staffing, communicating emergency plans, communicating after disaster strikes, and leading effectively.

Conclusions

The events at hospitals in the New Orleans area unfolded following first a Category 3 hurricane and then levee failures that resulted in floodwaters up to 19 feet deep throughout the majority of the city. Of concern to the practice of emergency planning, leadership, and decision making under crisis is not so much the type of disaster but rather the consequences. The functioning of and safety within hospitals was compromised by loss of utilities and failure of communication systems. When evacuations were necessary, the roadways prerequisite to traditional surface transportation were impassable. Such outcomes could be replicated in a number of extreme events that hospitals might experience, including natural forces (such as blizzards, tornadoes, or earthquakes), failures of technology (such as industrial or transportation disasters), or mass violence (such as terrorist attacks) (Norris 2002).

Regardless of the cause, various disasters and extreme events can damage hospital infrastructure, compromise the health and safety of patients, and strain a medical system's ability to care for residents who become wounded or ill during a disaster. People expect hospitals to withstand all natural disasters, including floods, hurricanes, blizzards, and earthquakes. Similarly, people expect hospitals to respond when their community faces nuclear, industrial, transportation, or other manmade

disasters (e.g., terrorism). In considering the consequences of disasters for communities, hospitals merit special attention because of their complexity and occupancy characteristics, and because of their role during disasters (Pan American Health Organization 1993; Sternberg 2003). In this sense, hospitals are vital components of a community's critical lifelines, and emergency planning and leadership decision making should ensure that hospitals are able to *respond* to a disaster and not become its *victims*. The importance of quality leadership and decision making in organizations like these cannot be overstated.

A number of hospitals have experienced disasters in the past, but the impassability of surface transportation surrounding *nearly all* hospitals within an urban area was highly unusual, and hospitals were largely helpless because of their inability to evacuate patients and staff using traditional means. Instead, hospital administrators relied upon FEMA and other emergency response organizations to conduct evacuations. Seldom have hospitals been so powerless to move people to safety when hospitals must be evacuated as they were in the New Orleans flood. Exacerbating this pervasive sense of helplessness was the fact that the hospitals could not communicate effectively with each other, not even when they were located across the street from one another.

The seven lessons learned in New Orleans were gleaned from Hurricane Katrina and the flood, but may be applicable to emergency planning and leadership decision making for a variety of extreme events, not just for hospitals but for other organizations as well. Any organization that depends on the external environment for essential inputs (e.g., human resources, energy, supplies) and that neglects these lessons risks ruinous failure in the face of all-too-likely disasters. That these lessons for organizations relate directly to what Useem and his colleagues (2005, 464) characterize as the four major leadership attributes (strategic thinking, resource mobilization, effective execution, and personal selflessness) is no mere coincidence. Learning from other leaders' experiences should enable future organizations to be more resilient when facing various crises.

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Disaster Realities Following Katrina: Revisiting the Looting Myth

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Abstract

Although the sociological literature has long suggested that widespread looting in the aftermath of disaster situations is a myth, a significant number of media reports made reference to looting in the aftermath of Hurricane Katrina. As part of a quick-response field study, 71 face-to-face interviews were conducted with individuals and organizational actors in Louisiana in an effort to explore the type of behavior that actually occurred in the aftermath of Hurricane Katrina with respect to the looting and appropriating of items. This chapter discusses the distinctions between looting and appropriating behavior, as well as suggestions that in this disaster some individuals took advantage of opportunities presented by certain situations, that looting stemmed from longstanding social inequalities, or that the level of devastation exceeded what has been researched in the past. Further research is needed to assess who, exactly, was arrested and the details related to their cases. An analysis of submitted store loss claims is also necessary in order to discover what items were most often taken in the aftermath of Hurricane Katrina.

Keywords: looting, appropriating behavior, media, crime, Katrina

On August 29, 2005, Hurricane Katrina made landfall in the Gulf Coast area as a strong Category 3 hurricane on the Saffir-Simpson scale. The major impacts the storm had in terms of human, structural, and economic losses resulted in one of the most devastating disasters in U.S. history. In the days and weeks following

Hurricane Katrina, a number of media reports emerging from New Orleans proper and the heavily impacted surrounding parishes, made extensive references to reports of looting. In the *New York Times* alone there were over 60 articles that mentioned looting in the time period from September 1 to November 19, 2005.

There is a discrepancy between longstanding assertions in sociological literature on disasters portraying widespread looting as a myth (Fischer 1988, 1998; Quarantelli 1994; Siman-Zakhari 1988; Gray and Wilson 1984; Goltz 1984) and the conflicting reports that emerged from those areas heavily impacted by Hurricane Katrina. This chapter focuses on the extent to which looting and appropriating behavior took place in the aftermath of Hurricane Katrina. Given the data and previous research on disasters, this study offers some suggestions for the motivations behind the looting and appropriating behaviors that merit more in depth study. The distinctions between looting and appropriating behavior are discussed, as well as suggestions that, in this disaster, some individuals took advantage of opportunities presented by circumstances, that looting stemmed from longstanding social inequalities, or that the level of devastation exceeded what has been researched in the past. As part of a larger quick response field study conducted by a team of researchers from the Disaster Research Center (DRC) less than one month after the hurricane made landfall, 64 face-to-face interviews were conducted with individuals and organizational actors in Baton Rouge, New Orleans, and surrounding parishes of New Orleans. Seven months after the hurricane, follow up interviews were conducted with seven organizational actors in New Orleans and surrounding parishes, including law enforcement officials, for a total of 71 interviews.

The Looting Myth

Gray and Wilson define looting as "both grand and petty larceny of personal property during and after disaster impact" (1984, 2). According to Fisher "the average American believes that panic, disaster shock, and looting are part of the normal behavioral response to disasters" (1998, 1). Arguably, widespread looting is one of the most expected behavioral responses to a disaster. In disaster's aftermath, it is not uncommon to witness police departments warning the public and preparing against instances of looting; media reporting stories of its occurrence; and governors calling on the National Guard to protect communities against looting. Research (Fischer 1998; Tierney et.al. 2001) has found cases where individuals state that fear of property being stolen factors into their evacuation decision making during a disaster event. In the aftermath of Hurricane Katrina neighbors did not believe that their possessions would remain safe when they evacuated from their homes (Miller 2006). Disaster victims themselves help to spread the belief that disasters are followed by theft and looting. Studies reveal that a large percentage of

disaster victims make reference to the fear of theft and looting, but the majority of these individuals have never actually been victims themselves (Lepointe 1986).

Quarantelli suggests that, especially to inexperienced officials and journalists, disasters are thought to maximize opportunities for antisocial behavior to surface. These inexperienced officials and journalists speculate that disaster survivors are easy targets for looters. As Quarantelli explains, "The imagery is that Mr. Hyde takes over from Dr. Jekyll at the time of the emergency, property crime rates will rise, violent crimes will increase, and exploitative behavior will spread" (1994, 1). In disaster times, many believe that social bonds will break down, causing individuals to cease to act in an orderly fashion.

Previous Studies on Looting

Research has found that widespread looting rarely occurs in the aftermath of a disaster (Birkland 1998; Quarantelli 1994; Siman-Zakhari 1988; Fischer 1988; Gray and Wilson 1984; Goltz 1984). According to Quarantelli (1994), widespread looting during disasters is not a problem and often not even a single case occurs. Gray and Wilson (1984) emphasize that studies conducted by the DRC between 1963 and 1984 consistently found the same result: little looting occurs in disasters. Researchers (Quarantelli 1994; Gray and Wilson 1984) state that during a disaster, standard crime as a whole drops below the routine reported rates, whether in terms of police reports or of arrests made. The incidence of postdisaster crime, particularly looting, is much less than what is believed by residents and the media (Birkland 1998).

Fischer (1998) maintains that while looting sometimes does occur, concern for it far exceeds the rate at which it actually takes place. According to Lepointe (1986) there is a widely held belief in the postimpact period of a disaster that there will be an outbreak of crime, especially theft and looting. However, Lepointe (1986) contends, past research, along with more recent findings, indicates that the criminal effects of a disaster are exaggerated and that the belief of a crime outbreak during the disaster is not based on facts.

Crime statistics for the period during hurricanes Frances, Ivan, and Jeanne that impacted the southern United States and the Caribbean in August and September of 2004 were compared with crime statistics for the same time period during previous or subsequent years in order to address the question of whether or not looting actually does occur in the aftermath of such disasters (Barsky 2006). Statistics were examined to determine the extent to which crime increased or decreased in the time period surrounding the hurricane. Overall it was found that there was no marked trend of significant increases or decreases (Barsky 2006).

Media Reports on Looting

Past studies of the media's reporting of looting in natural disasters show that although many studies report looting rarely occurs during a disaster, the media frequently reports on looting during these events. According to Eisenberg (2003), because media reports are often misleading, the media can be a major source of inaccuracy when reporting on disaster behavior. In many cases, the media do not always properly check the information they circulate or give into temptations to overdramatize their news reports in order to boost ratings. Goltz (1984) argues that the more rational and altruistic response to human disasters are largely ignored by news stories. Instead social breakdown behaviors and institutional efforts to control these behaviors are emphasized (Goltz 1984).

An analysis conducted by Goltz of the *Los Angeles Times* and *Santa Monica Evening Outlook's* coverage of four earthquakes found that little attention was paid to disaster myths. Rather, the overwhelming emphasis was on organizational and emergent adaptive action (Goltz 1984). In contrast to the study by Goltz, Wenger and Friedman focused on local and print coverage of Hurricane Alicia, which impacted the Galveston-Houston area the morning of August 18, 1983. The findings show that 10 percent of all local stories mentioned looting. Myth dissemination was most often found in the local newspaper reports on criminal behavior and looting (Wenger and Friedman 1986).

A recent content analysis of local, national, and international print news media reports of hurricanes Frances, Ivan, and Jeanne showed that, overall, the print news media mentioned looting less often than in past research. The majority of articles focusing on these four hurricanes reported not on claims of looting but rather on deaths resulting from the hurricanes, forecasted hurricane paths and projected hurricane landfall, hurricane costs, and experiences and fears resulting from the hurricanes, among other categories. Although there were claims of looting found in local, national, and international media reports, these claims were found less often than in previous studies conducted on the topic (Barsky 2006). When comparing national and local news reports on looting and price gouging, national news sources made reference to looting slightly more often than local news sources. National news sources' reports on looting were most likely to be found in the post-disaster time period, made reference to actual numbers of looting cases occurring, and were hard news articles. In contrast, local news reports on looting were most likely to be soft news reports mentioning the possibility of looting (Barsky 2006).

Despite past research indicating no significant increases in looting-related behavior in the aftermath of natural disasters, the media made reference to a number of looting reports following Hurricane Katrina. The media reports, both about volume and persistence of looting and other types of antisocial behavior, wereunparalleled

in the aftermath of Hurricane Katrina (Dynes and Rodríguez 2005). Between August 31, 2005, and October 11, 2005, seven *Washington Post* articles made mention of looting. Many of these articles focused on rampant looting that supposedly occurred in the aftermath of Hurricane Katrina, making such claims as:

> Looting began on Canal Street in the morning, as people carrying plastic garbage pails waded through waist-deep water to break into department stores. In drier areas, looters raced into smashed stores and pharmacies, and by nightfall the pillage was widespread (Gugliotta and Whoriskey 2005).

Another *Washington Post* story made a similar claim, stating that "in the chaos that followed Katrina's flooding, looters targeted everything from grocery stores to gun shops to trendy women's clothing boutiques" (Martel 2005).

Between September 1 to November 19, 2005, 66 articles mentioning looting were found in the *New York Times*. A September 29th issue stated: "At dusk on Aug. 29, looters broke windows along Canal Street and swarmed into drugstores, shoe stores, and electronics shops, Captain Anderson said. Some tried, without success, to break into banks, and others sought to take money from the ATM's" (Dwyer and Drew 2005).

In some cases media reports made in the aftermath of Hurricane Katrina conflicted with more detailed findings gathered by a team of onsite DRC researchers less than one month after Hurricane Katrina (Barsky et al. 2006). For example, a FEMA official recounted that what the agency actually did to guard the medical supplies conflicted with the media's portrayal of what had occurred. This official spoke about a situation in which members of FEMA were asked by owners of a New Orleans pharmacy to take care of the medical items belonging to that pharmacy. According to this official, the way the media portrayed the situation made it appear as if members of FEMA were breaking into the pharmacy and looting items (Barsky et. al 2006). Likewise, reports mentioned above stating widespread pillaging and "chaos that followed Katrina's flooding" contradicted reports made by a number of individuals being interviewed that many people behaved positively in the aftermath of the hurricane. A New Orleans law enforcement official commented that "most people by and large really, really, really just helped one another and they didn't ask for anything back," (Barsky et al. 2006). A law enforcement official in St. Tammany Parish also reported that officials delivered bottles of water and meals ready to eat (MREs) to people in the parishes for weeks after the hurricane. This official stressed that the majority of citizens, whether law enforcement officials or neighbors looking out for each others homes, behaved positively in the aftermath of Katrina and went out of their way to help others. A question remains

about the extent to which the media made references of widespread looting in the aftermath of Hurricane Katrina and the extent to which such incidents actually happened.

The impact that media reports about widespread looting had on citizen responses was observed in interviews with evacuees in the aftermath of Katrina. In response to these media's reports, one evacuee from the West Bank of New Orleans, who was staying at a Holiday Inn Hotel in Baton Rouge, commented:

> *I encouraged him to get a gun because I was afraid and I kept thinking if my house is ok, I don't want it to be destroyed by looters. And the part of town that we lived on, we were told is where they were sending people . . . there were many reports of people living in homes and looting and fires.*

An evacuee originally from New Orleans at a mass care shelter in Baton Rouge stated that police had to force him to evacuate from his apartment after the flooding occurred. He did not willingly leave his home due to reports he heard on the news that indicated looting was occurring (Barsky et al. 2006). This reinforces the literature on looting showing that individuals' state that fear of property being stolen factors into their evacuation decision making during a disaster event (Fischer 1998).

A discussion about the racial characterization of looting also emerged in the aftermath of media reports on looting. According to Kaufman (2005), a pair of photos with their captions began circling the Internet in the wake of Hurricane Katrina showing an African American "looting" an item while a white couple was shown "finding" food. The first photo showed a young African American man carrying a case of soda and a bag through chest-deep water. The caption stated that he had just been "looting a grocery store." The second picture presented a white couple also carrying food through the waters, and stated that they were spotted "after finding bread and soda from a local grocery store" (Ralli 2005 in Kaufman 2005). The comparisons of these two captions led to many criticisms that the media was portraying blacks and whites differently in terms of behavior in the aftermath of Katrina.

Methodology

To determine what type of behavior actually occurred in the aftermath of Hurricane Katrina with respect to looting, a total of 71 interviews were conducted with individuals and organizational actors in Baton Rouge, New Orleans, and surrounding parishes of New Orleans, including Jefferson Parish, Saint Tammany Parish, and Slidell. These interviews included questions regarding reports of looting that came

out of Louisiana. Sixty-four individual face-to-face interviews were carried out by a team of three researchers conducting quick response research in the aftermath of Hurricane Katrina. The interviews took place over a 10 day period, from September 21 to September 30. Where looting had been reported, attempts were made to differentiate between whether individuals were taking nonessential items or were taking items necessary for survival. Where nonessential items were involved, explanations were solicited regarding motivations for this behavior.

Using purposeful and snowball sampling, individual interviews included respondents such as occupants at a mass care shelter in Baton Rouge, occupants of a Holiday Inn Express hotel in Baton Rouge being used to house evacuees, citizens of Louisiana communities, and emergent responders such as volunteers or citizens who had either been affected by or were responding to the aftermath of Hurricane Katrina. Organizational actors included responders at the local, state, and federal levels. Although initial quick response research included interviews conducted with individual residents in some Mississippi communities, this chapter relies solely on the data collected on looting and appropriating in Louisiana. Future analysis will compare these issues among the distinct geographic areas impacted by Katrina.

Followup interviews were conducted with seven organizational actors located in the New Orleans metropolitan area and surrounding parishes of Jefferson Parish and St. Tammany Parish, including law enforcement officials, a member from a local insurance company working with burglary and theft claims in the aftermath of Hurricane Katrina, and a member of a nonprofit organization created to reduce crime and public corruption. These followup interviews were conducted seven months after the hurricane, between March 26 and March 31. This second round of interviews focused on obtaining statistical information on the number of charges and arrests made associated with looting-related activity, the prevalence of looting in various sites around the city of New Orleans and surrounding communities, and crime rate differences when the hurricane period was compared to more routine periods. In those cases where looting did occur, information was obtained about what kind of items were taken as well as where such items were taken.

A respondent is defined as being "a person who provides data for analysis by responding to a survey questionnaire" (Babbie 2001, G9). In contrast, an informant is defined as "someone well-versed in the social phenomenon that you wish to study and who is willing to tell you what he or she knows about it" (Babbie 2001, G5). For the purpose of the interviews conducted in the aftermath of Hurricane Katrina, interviewees were treated as informants rather than respondents.

Claims of Looting

An overall theme emerged when speaking to organizational actors: there were more reports of looting in downtown New Orleans than in areas outside of the city. According to a New Orleans law enforcement official, instances of looting arrests were *low* in the first week after Hurricane Katrina and during Hurricane Rita but *spiked* when the city was reopened to citizens more than a week after the hurricane (Barsky et al. 2006). A New Orleans law enforcement official commented that a main reason for the low number of arrests in the hurricanes' immediate aftermath was that lifesaving and rescue were the primary concerns of law enforcement officials. Another official pointed out that "initially all you wanted to do was rescue. Rescue, rescue, rescue: that was the primary concern." A law enforcement official from Jefferson Parish added to this statement when he commented that in the time period immediately after the hurricane, the 911 system was down and the police resources were stretched thin. During this time, the primary focus was on saving lives. As this official explained, welfare of property came second to saving victims.

Another reason that very few arrests were made in the initial aftermath of Hurricane Katrina was that there was no place to hold those who were arrested. A New Orleans law enforcement official stated, "There were very few arrests made initially because we had no place to put [the criminals]. We did not have a jail; there was no place to put them." Once a temporary jail for looters was set up at a Greyhound Amtrak Terminal station in downtown New Orleans, statistics obtained from an official stationed there showed that as of September 28, 2005, the day the interview was conducted, 237 looting-related arrests had been made at the facility since it was established (Barsky et al. 2006). According to a New Orleans law enforcement official, "very few arrests were made at the time [immediately following the hurricane]. Within weeks after the storm, a large number of looting arrests were made . . . even now, six months later, we have had looting arrests fairly recently."

Data obtained from the official stationed at the temporary jail about looters actually show a decrease in crime when compared to crimes during a nondisaster time period. Citywide crime statistics from the New Orleans Police Department Technical Services Bureau Information Systems and Services Division (2004) reported that there were a total of 17,782 instances of theft and burglary in 2004, averaging out to 48.7 burglaries or thefts per day. These data point to a *decrease* in arrests for looting or similar offences during the time period following Hurricane Katrina relative to a nondisaster timeframe. Researchers (Quarantelli 1994; Gray and Wilson 1984) state that during a disaster, standard crime as a whole drops below the everyday reported rates, whether in terms of police reports or of arrests made. The incidence of postdisaster crime, particularly looting, is much less than what is

believed by residents and the media (Birkland 1998). A New Orleans law enforcement official also spoke of a decrease in crime in the City of New Orleans in the aftermath of Katrina. According to this official, "crime right now is at an all time low for the City of New Orleans. We have probably a 90 percent or 80 percent reduction on overall crime and 75 percent or more of persons crimes, violent crime." When asked the reason for this reduction he stated, "A lot of our criminal element left town. They were displaced . . . there are fewer people and a large part of our criminal element was displaced with the storm."

When comparing crime statistics from September through December 2004 to the same time period in 2005, statistics obtained from an official in St. Tammany Parish showed that burglary rates increased from 235 cases in 2004 to 375 cases in 2005. Looting, which was listed in the crime statistics for St. Tammany Parish as being "a higher form of burglary," was included in the burglary statistics. According to a law enforcement official in St. Tammany Parish, 71 arrests for looting, burglaries, or theft were made between August 29, 2005, and October 5, 2005. In contrast to the statistics showing a decrease in arrests for looting or similar offences during the time period following Hurricane Katrina relative to a nondisaster time period in New Orleans, these statistics obtained from St. Tammany Parish actually showed an increase of 140 burglaries in 2005 when compared to the same time period a year earlier.

A conversation with an insurance representative in New Orleans also referenced an increase in crimes reported in the aftermath of Hurricane Katrina. This individual stated that "we saw a large number of looting claims as a result of Katrina." He went on to estimate that the insurance company that he worked for processed between 30,000 to 40,000 claims of looting in the New Orleans Metro area, which includes New Orleans Parish, St. Tammany, St. Bernard, Jefferson, and St. Charles Parishes. The majority of these claims were made by homeowners. While the insurance representative could not provide any statistics when asked to contrast the number of looting and burglary claims post-Katrina to the time period before the hurricane, he did explain that the personnel necessary to process the number of claims had increased substantially after the disaster. According to this informant, in the pre-Katrina period there were only three or four homeowner units in the New Orleans area dealing with homeowner claims, with each of these units having between seven and nine members. However, after Katrina, thousands of people were brought in to help process claims.

Limitations of Crime Statistics

With respect to obtaining crime statistics in the aftermath of disaster situations, there are limitations. First, statistics themselves could be misleading. Although a

New Orleans law enforcement official made reference to the fact that crime had decreased in the City of New Orleans in the aftermath of Hurricane Katrina, an official from a nonprofit organization created to reduce crime and public corruption stated that he disagreed with that statement. According to this official, police used a new format when filling out reports in the aftermath of Hurricane Katrina. In this new format, reports for looting were reported under a new category called 21K, which was a code designed for miscellaneous items that were lost or stolen. Police units responding to burglary and looting claims in the aftermath of Katrina were reporting these claims under this new category. According to this official, crimes reported under the category of 21K were not tabulated in the official Uniform Crime Reports' burglary and crime statistics. Information gathered from the New Orleans Police Department indicated that from October 14, 2005, to January 16, 2006, 62 percent or 1,652 complaints of missing property were classified under the 21K lost or stolen category. This number contrasted with 1,030 total reports of businesses and residential burglaries reported after Katrina (New Orleans Police Department 2006). Because the police were using this new category to report crime statistics differently, it appears that crime statistics decreased; however, this may not be the case.

According to Joel Best, "statistics—even official statistics such as crime rates, unemployment rates, and census counts—are products of social activity . . . all statistics are created through people's actions," (2001, 26). Crime statistics during times of natural disasters may be tabulated differently than crime statistics during nondisaster time periods. Police and those individuals whose job it is to report statistics may be preoccupied with other hurricane related tasks. They may be unable to record all arrests or claims in the same way that they would be recorded in a nondisaster time.

Second, the fact that disasters may negatively impact the record-keeping system following the disasters must be taken into account when viewing the crime statistics in the time period immediately following the disaster (Barsky 2006). A New Orleans police official commented on this problem when he stated that they do not have numbers or figures documenting arrests after the storm compared to later periods. He stated, "our computer system, the main frame was pretty much knocked out. We are still doing everything manually." An example of this technology issue was found in an interview with an official from Jefferson Parish. According to this individual, Uniform Crime Reports for September and October of 2005 could not be tabulated because the computer system was inoperable due to the impacts of Hurricane Katrina. The Uniform Crime Report for 2005 for Jefferson Parish lists a total of 2,874 burglaries for the year. For 2004 there were 3,282 burglaries for the year. Although the Uniform Crime Report for 2005 shows a decrease in burglaries of 12.5 percent when compared to the previous year, because Jefferson Parish has

only 10 months of statistics for 2005, these statistics cannot accurately be compared to those for any other year.

Third, there are many crimes that go unreported. There is an expression called "the dark figure" that is used by criminologists when referring to a proportion of crimes not appearing in crime statistics (Best 2001, 33). Simply put, this is a discrepancy between the number of reported crimes and the total crimes that may actually occur. Due to other activities involving the response to the hurricane, a number of crimes may not have been reported during that initial period. When compiling uniform crime reports, different agencies may use different methods in collecting statistical information or different definitions in defining types of crime, thus making it hard to compare reported statistics in one situation with reported statistics in another.

Finally, there are instances where some police officers turned a blind eye to the looting, while others made an arrest. The use of discretion in looting—or the lack thereof—will lead to differential reporting regarding overall crime statistics. Research has found that police often use discretion when making arrests during routine periods. For example, according to Skolnick, "it is impossible to eliminate discretion entirely from the administration of criminal law, even for such a simple and routine operation as the enforcement of parking meter violations," (1975, 74). The same finding may hold true in the immediate postdisaster environment, where police use discretion regarding who gets arrested for cases of looting and whose activities are tolerated as necessary appropriating behavior.

Looting vs. Appropriating Behavior

Gray and Wilson (1984) define looting as, "both grand and petty larceny of personal property during and after disaster impact." Further, they defined appropriating behavior as involving a person taking property owned by another for use for emergency purposes and, depending upon the item, with the intent of returning it at a later date. There were many reports of both looting and appropriating behavior occurring in the aftermath of Katrina.

Appropriating behavior is easily mistaken for looting (Eisenberg 2003). According to Turner and Killian's emergent norm theory, an emergent norm is an emergency-revised definition of a situation, not a precise rule guiding collective action (Turner and Killian 1987 in Aguirre, et al. 1998). What could be interpreted as stealing in nondisaster situations could be viewed by the participants as a legitimate behavior given the necessity of appropriating goods in order to survive during the time period following a disaster, even if outsiders are unaware that a new norm has emerged and within what context (Barsky 2006).

Again, references were made during our interviews to both looting and appropriating behavior that occurred in the aftermath of Hurricane Katrina. According to a New Orleans law enforcement official, widespread looting occurred in the Wal-Mart in New Orleans: "Some people grabbed clothing but it wasn't the t-shirts and jeans that you needed . . . the community came in, if they saw the opportunity to take dresses, purses, TV sets just because it was there." This individual went on to mention further accounts of looting, stating "at the Blockbuster Videos and things like that it wasn't uncommon to see people with armloads of videos and DVDs." When looting did occur, items were taken from both homes and businesses, with statistically more belongings being taken from private residences (New Orleans Police Department 2006). These statistics indicate that in the time period from October 14, 2005, to January 16, 2006, nearly nine times more items were reported burglarized from individual residences (921 items) than from businesses (109 items). Still, as the statistics show—and this statement by a New Orleans law enforcement official suggest—businesses did not go unscathed:

> *The extent of looting in homes seems to be quite large but the business places in the city took a tremendous, tremendous hit. Business places, grocery stores and department stores and places down town. Shoe stores, clothing stores, stores along Canal Street were just devastated. People just went in and helped themselves.*

To better distinguish between looting and appropriating behavior in retail stores in the aftermath of Katrina, as well as to take inventory of the items most often taken, future study of loss claims made by the stores is necessary.

With respect to appropriating behavior, officials in New Orleans, Jefferson, and St. Tammany Parish all made reference to people taking items such as food and water that were necessary for survival. Officials from all three parishes stated they did not witness arrests being made for taking items necessary for survival. As one New Orleans law enforcement official stated, "there were people that were taking those things necessary to survive and no one, no one was going to be critical of that. . . . If somebody was taking food and water we just let them have that to go."

A major finding that emerged from this research was that there is no clear definition of what separates looting from appropriating behavior that is accepted by the general public or agents of social control. The issue of what constitutes appropriating behavior versus looting is debatable and primarily depends on an individual's perception of the situation (Barsky et al. 2006). Thus, what one officer could have viewed as a case of looting, resulting in an arrest, might be seen as an instance of appropriating behavior by another. Consider the previously mentioned pair of photos circulated on the Internet in the wake of Hurricane Katrina showing an African American "looting" while a white couple was shown "finding" food

(Kaufman 2005). Citizens, too, could have formed different opinions about which items constituted necessities as opposed to the nonessential. The lack of a precise distinction between the concepts of looting and appropriating behavior can be problematic as it relies on how an individual views a situation, and that personal view statistically affects how crimes are reported in the aftermath of a disaster.

Explanations for Looting

Despite the fact that crime statistics are not always accurate and that cases of reported looting could have, in fact, been appropriating behavior, there were a number of actual cases of looting that occurred in the aftermath of Hurricane Katrina. Because these cases of looting contrast with the social science literature stating that widespread looting rarely occurs in the aftermath of a disaster (Birkland 1998; Quarantelli 1994; Siman-Zakhari 1988; Fischer 1988; Gray and Wilson 1984; Goltz 1984), this study offers some suggestions for the motivations behind the behaviors of looting and appropriating behavior in the aftermath of Hurricane Katrina. One explanation for looting was that it was a crime of opportunity. Disasters provide numerous opportunities for individuals to take advantage of unprotected homes and businesses (Miller 2006). A New Orleans law enforcement official commented:

> *As the community began realizing that there was a disaster, there was a problem, communication was down, a large part of our community just seemed to go wild . . . Too many people thought this was temporary. Breaking into a store and suddenly taking TV sets and radios seemed to be a fine idea because they could.*

It was the belief of many individuals interviewed that people were looting because the lack of law enforcement and the presence of post-hurricane conditions such as power outages and vacant areas presented the opportunity to do so. The same official added to this assessment when he commented, "local law enforcement was not in a position to deal with looters, to be painfully honest."

Many evacuees were under the impression that the looting that did occur was just a manifestation of what already occurs in society and that those who did loot were those individuals who would partake in antisocial behavior regardless of the hurricane. According to officials in New Orleans, Jefferson, and St. Tammany Parishes, the majority of individuals who took part in looting behavior in the immediate aftermath of Hurricane Katrina were locals from within the impacted communities. However, in the months following the hurricane there were also cases of outsiders coming into the impacted communities and pretending to work as contractors, taking items from the top floors of impacted homes. The finding that initial looting was perpetrated by individuals from within the community conflicts with a

previous study (Lepointe 1986) stating that when looting does occur it is usually from people outside the disaster community.

A third explanation for the amount of looting could be the actual scope of the hurricane itself. The level of devastation in the aftermath of Hurricane Katrina exceeds that of many past disasters. There were 1,330 deaths post-Katrina with 80 percent of them coming from the New Orleans metropolitan area. Seventy-seven thousand people were displaced and there are estimates that property damage alone may approach the $100 billion mark. According to the White House report on Hurricane Katrina, it was the most destructive natural disaster in U.S. history (White House Report 2006). That a disaster of this scope has not been studied in the past could help to explain the number of reports of looting that occurred in the aftermath of Katrina.

Another explanation for looting is closely connected with issues of inequality. According to the 2004 Census, 67.8 percent of the residents in Orleans Parish were African American, compared to 33 percent in Louisiana overall. Likewise, according to the 2000 Census, 27.9 percent of residents in New Orleans were living below the poverty line as of 1999 compared to 12.4 percent of the population across the United States. In fact, 21 percent of the population in New Orleans reportedly made less than $10,000 per year in 1999 (U.S. Census Bureau 2000). As of 2005, over 27 percent of New Orleans lived below the poverty line (U.S. Census Bureau 2005). According to the 2000 census, 46,171 women in New Orleans were living in female-headed households, making up 24.5 percent of the population. Of these women, 14 percent of them had children ages 18 or under living in the household. An astounding 43.4 percent of them were reported as living below the poverty level (U.S. Census Bureau 2000). Even more significant is the fact that 52.4 percent of the female householder families with children 18 years old or younger in the home are living below the poverty level. As a result of these statistics, one can see that in New Orleans, African Americans and women in female-headed households were at a greater economic or financial disadvantage leading into the disaster. According to Cutter:

> [In New Orleans] the most impoverished lived in squalor-like conditions concentrated in certain neighborhoods within cities, with little or no employment, poor education, and little hope for the future for their children or grandchildren. It is against this backdrop . . . that we can best understand the Hurricane Katrina disaster" (Cutter 2005, 2).

In New Orleans poor women in single parent households and African Americans are struggling just to survive in day-to-day life. Even during nondisaster times, the housing market in the United States has systematically failed to provide housing

for many low-income households (Peacock and Girard 1997). According to a New Orleans law enforcement official:

> *Prior to Hurricane Katrina, the City of New Orleans had a very high crime problem. We had tens of thousands of people living in housing developments and low-income housing. It was basically a very poor city and a lot of people took the opportunity to do what they wanted to do.*

Social class is a major factor in explaining an individual's vulnerability and ability to respond to a disaster (Cutter 2005). In the developed world it has been argued that natural disasters foster the emergence of a consensus, whereas civil strife confirms the prior existence of dissention. The factors that give rise to antisocial behavior in periods of civil disruptions are simply not present in most natural disaster situations. However, in areas where social strife resulting from inequality is an issue impacting everyday life, "natural disasters sometimes seem to offer once-in-a-lifetime opportunities for attacking the party in power while it is distracted" (Stallings 1988, 571). In these types of circumstances, such as in St. Croix after Hurricane Hugo, the looting patterns seen in civil disturbances are generated in disasters. According to Quarantelli and Dynes:

> If property is thought of as the shared understanding of who can do what with valued resources within a community, in civil disorders there occurs a breakdown in this understanding. What was previously taken for granted now becomes a matter of open dispute, expressed concretely in a redefinition of existing property rights (1968, 8).

Quarantelli (1994) explains that looting in civil disturbances is widespread, collective, and public whereas the type of looting in areas impacted by disasters is very limited, individual, and private. Stallings (1988) uses conflict theory to help explain these types of situations. This theory can explain how the circumstances resulting from a natural disaster can be seen as a way for individuals suffering from social strife and inequality to try to improve their situation. These individuals may take part in such behaviors as looting during the postdisaster period in order to fight against their current impoverished state. Conflict theory asserts:

> An existing social structure characterized by inequality and conflict experiences social disruption which upsets the state in controlling allocation—distribution decisions, creating a power struggle between official and unofficial decision makers" (Stallings 1988, 576).

In the aftermath of Hurricane Katrina, individuals who previously lived in impoverished conditions may have seen the occasion as an opportunity to improve their situation and gain belongings they would not normally be able to obtain.

Conclusions and Implications for Future Research

The purpose of this chapter is to explore looting and appropriating behavior in the aftermath of Hurricane Katrina. A total of 71 interviews were conducted with individuals and organizational actors regarding reports of looting that came out of the area. Findings show that although few arrests were made in the immediate aftermath of the hurricane due to law enforcement's focus on life-saving issues rather than property crime, a number of arrests were made once a temporary jail was set up in the New Orleans area. Despite discrepancies in crime statistics, there were actual incidents of looting. Given the data and previous research on disasters, this study offers some suggestions for the motivations behind the looting and appropriating behaviors that merit more in-depth study. Informants speculated on motivations for taking the property of others, including the opportunity that the lack of law enforcement and post-hurricane conditions such as power outages and abandoned areas presented. Also, looting may have been a result of social strife resulting from inequalities. In the time period prior to Hurricane Katrina, New Orleans was a very poor city with 27.9 percent of residents in New Orleans living below the poverty line according to the 2000 U.S. Census, compared to a national average of 12.4 percent. Among other motivations for taking the property of others is the possibility that looting may have just been a manifestation of behavior already present in society and that those who did loot were those individuals who would partake in antisocial behavior regardless of the hurricane. Some difficulties arose in analyzing motivation because the level of devastation in the aftermath of Hurricane Katrina exceeded what had been researched in the past.

The distinction between looting and appropriating behavior have been discussed, with a major finding suggesting that there is no clear distinction between what constitutes looting vis-à-vis appropriating behavior; it is subjective. What can be considered looting by one individual could, in fact, be appropriating behavior to another. Because there is no universally accepted definition of what constitutes appropriating behavior or looting, the issue primarily depends on an individual's perceptions. Challenges in determining the level of looting versus appropriating behavior are exacerbated by misleading crime statistics that may be tabulated differently during disasters than in the time period before or following the event, the negative impact of the disaster on record keeping systems, and the fact that many crimes go unreported in the aftermath of disaster situations.

A qualitative approach to understanding the process of looting is key to understanding the phenomenon and distinguishing between looting and appropriating behavior (Barsky et al. 2006). Hurricane Katrina is unique in the scope of the disaster itself, as well as in the number of media reports that made reference to rampant looting in New Orleans and the number of reports of looting that were made in the aftermath of the hurricane. This study enhances previous research on looting by providing information on the context in which activities labeled as looting occurred and suggesting the variety of ways that this same behavior could be interpreted as legitimate or not. The study also attempts to refine previous studies by providing possible explanations for looting behavior. Future research should focus on circumstances leading up to the participation in looting and should address the methodological challenges in accounting for actual versus perceived activity of looting. In cases where looting is reported, research must focus on who, exactly, was arrested and the details related to their cases, such as what goods were taken and what reason was given for taking the good or for being arrested? Further research must also be conducted to examine claims of loss by stores to distinguish how much was looted versus appropriated after Katrina and to determine what items were most often taken.

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Emergent Behavior and Groups in Postdisaster New Orleans: Notes on Practices of Organized Resistance

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Abstract

This chapter focuses on emergent phenomena in New Orleans immediately following Hurricane Katrina, more specifically emergent participation in disaster response and recovery efforts. Drawing on ethnographic methods including informal and in-depth interviews, participant observation, and systematic collection of movement-produced documents, I offer descriptive data on the nature of several emergent group activities in New Orleans following the storm. In addition to providing temporary assistance through disaster relief and early recovery efforts, many of the groups actively resist structures of power, authority, and inequality. Here I provide preliminary analyses of data gathered from post-Katrina New Orleans demonstrating a type emergent group known to disaster researchers: emergent groups at emergency times. Other types of emergent behaviors observed in the wake of Hurricane Katrina are also discussed. Finally, this report highlights the importance of grassroots networks in the events studied and suggests increased attention to the emergent phenomena in relation to resistance, social movements, and justice-oriented activities in catastrophes.

Keywords: disaster, emergent behaviors and groups, resistance, ethnography

The convergence of volunteers on disaster impact sites is well documented and emergent behaviors and groups in crises encourage continued attention to the role of civil society in catastrophic events. The disaster surrounding Hurricane Katrina on the Gulf Coast, as well as the subsequent failures in the flood protection system protecting the city of New Orleans, is no exception. This chapter focuses on emergent social activities in New Orleans following Hurricane Katrina and is intended to provide a partial view of various response and early recovery activities, as well as practices of organized resistance, related to social group formations and behaviors in disaster. Drawing on qualitative, ethnographic data, including informal and in-depth interviews, participant observation, and the systematic collection of natural documents, this research explores emergent phenomena following the Katrina catastrophe by describing various emergent group activities and grassroots organizing.

Though conceptualized in terms of emergent organizational behavior in disaster response and early recovery, the activities discussed here also reflect multidimensional issues centering on power, resistance, authority, justice, and civil society in times of emergency. This chapter serves as a preliminary analysis of several unique examples of emergent phenomena that demonstrate various forms of creativity, innovation, and resistance in times of crisis and that also show how the postdisaster setting provides a unique research opportunity to study collective behavior and incipient social movement activities.

It is beyond the scope of this chapter to provide a historical description of specific emergent groups that would sufficiently address their many layered complexities, internal group dynamics, successes and failures, and general social histories. Instead, the data provide various illustrations of emergent phenomena following Hurricane Katrina as it relates to civil society, collective behavior, and resistance to hegemonic structures. Because many emergent groups had their origins in the activation of existing grassroots networks, this chapter argues that more attention should be paid to pre-existing social movement networks in analyses of emergent phenomena in disasters. To a great degree, emergence cannot take place in isolation from pre-existing social relations, including those that characterize material and virtual social movement networks. This chapter concludes by developing a notion of emergent practices of organized resistance as both theoretical and empirical contributions to studies of organizational response to disaster.

Existing Literature on Emergent Behavior and Groups

Emergent groups are part of a familiar four-part typology of task and structural arrangements in disasters developed by Dynes (1970; see also Stallings 1978; Tierney, Lindell, and Perry 2001) to classify various organizational responses to disaster

situations. This typology of organizational adaptation in disasters includes established, expanding, extending, and emergent organizations. Established organizations (Type I) maintain regular tasks within the existing structural arrangements. Expanding groups (Type II) perform regular tasks but are managed within a new, dynamic structure. Extending organizations (Type III), on the other hand, perform nonregular tasks within the existing structure. Finally, emergent organizations (Type IV) take on new tasks within new structural arrangements. Wenger (1992) expands the typology and encourages researchers to engage the analytical notion of Type V (or supraorganizational) organizations that encompass the concurrent interrelationships between all four parts of the familiar disaster typology.

According to Stallings and Quarantelli (1985), emergent groups "can be thought of as private citizens who work together in pursuit of collective goals relevant to actual or potential disasters but whose organization has not yet become institutionalized" (94). In other words, emergent groups are composed of members that organize themselves to take on crisis-related tasks that are new to the group and display new forms of structural arrangements. Dynes (1970) suggests that Type IV groups tend to emerge under two specific disaster circumstances. First, emergent groups tend to form in situations when people in the impacted areas are isolated from established (Type I) emergency groups. Second, emergent groups often develop under conditions characterized by "lack of information about the scope of a disaster and in which there is a lack of coordination and control among various groups which become involved" (Dynes 1970, 146).

Recently, Drabek and McEntire (2003) completed a systematic review of the literature on emergent phenomena to validate previous scholarly findings, describe important trends, and provide suggestions for expanding theoretical conversations on the issue. They also summarize recent literature that has expanded the debate on emergent phenomena through increased attention to the further classification of emergent groups; the development of additional categories of emergent phenomena; the exploration of the nature of emergence in different phases and types of disaster; an assessment of the impact that culture, religion, gender, and ethnicity/race may have on emergence; and comparisons of emergence in other countries (2003, 100).

Expanding on the debates outlined by Drabek and McIntire (2003) that, in part, call for exploring emergence in different phases and types of disaster, spatial emergence across geographic scales in disaster also warrants more explicit theoretical and empirical consideration. The discussion of the geography of disaster is not entirely new to the field. With respect to existing research, Tierney (1994, 13) suggests that emergence is positively related to the scope and magnitude of disaster. Dynes (1970, 140) proposes a typical sequence of organizational involvement

based on the scale of the disaster with emergent (Type IV) organizations tending to develop in response to major community disasters rather than localized emergencies. Even more, Dynes (1970, 58) presents a spatial representation of a disaster event in which a series of concentric circles extending from the immediate impact area trace the spatial relationships with organized community aid and regional aid that then filter through various zones to the total impact area. In other words, the severity of disaster is positively related to the scale of group emergence.

In addition to the typology of group emergence, Quarantelli (1996) outlines a typology of emergent behavior that points to a potentially higher frequency of task emergence than structural emergence that operates in disaster. Within this revised typology, there is increased attention to behavioral emergence that occurs at the level of practice and action. First, groups with existing structures may perform existing functions but with modified procedures to accomplish the task. This is conceptualized as a form of *quasi-emergence*. Second, the expanded typology also accounts for organizations that develop some new structure and carry out existing tasks, but that do not qualify as an extending group. The temporary structural adaptation is called *structural emergence behavior*. Third, a term known as *task emergence*, accounts for instances when group structures remain the same but where new tasks are developed to meet the situational need. Lastly, consistent with the old organizational typology, emergent groups refer to new structures and new functions, which often are ephemeral in nature.

In March 2006, the *Annals of the American Academy of Political and Social Science* dedicated an entire special issue to research related to Hurricane Katrina. Of particular relevance to this chapter is a fascinating discussion by Rodríguez, Trainor, and Quarantelli (2006) on emergent and prosocial behavior following Hurricane Katrina. Rodríguez et al. (2006) contend that despite the negative imagery spread around the world by the mass media, which portrayed the situation that unfolded in New Orleans as a "state of anarchy; anomie, chaos, disorganization, regression to animal-like behavior; and a total collapse of social control, agencies, and personnel" (83), the residents of New Orleans "rose to the challenge" through innovative coping behaviors that were overwhelmingly prosocial in nature. The authors argue "emergent activities in the impacted region showed a different and opposite pattern to those suggested by the imagery employed by the media outlets" (84).

Research on emergence in disasters has both informed and been informed by the sociology of collective behavior (Quarantelli 1996; Dynes and Tierney 1994). Neal and Phillips (1990) argue that in some cases emergent groups meet the criteria for social movement organizations as put forth by McCarthy and Zald (1977) and movement organization locals as described by Lofland and Jamison (1984). Drawing on the assumption that emergent groups can, at times, be conceptualized as

social movement organizations, more attention needs to be given to the formative and relational dynamics of the emergent groups relating to justice-oriented activities in disaster situations.

A great deal has been written about convergence (Fritz and Mathewson 1957; Kendra and Wachtendorf 2001; Scanlon 1992), volunteerism (Neal 1990; Wenger and James 1994), and individuals feeling a need to help during the crisis period (Lowe and Fothergill 2003). However, there is less systematic research that focuses on emergent resistance and justice-oriented activities that often serve to maintain peace, justice, health, and safety during temporary disruptions in the functioning of law enforcement and medical institutions in catastrophic situations. Given the extent to which existing grassroots networks were activated in the immediate aftermath of Hurricane Katrina, the notion of emergent groups in emergency times may need to be reconsidered to account for the process-oriented nature of emergence and convergence in disaster situations through grassroots networks that exist in both material and virtual spaces. This process-oriented consideration points to the importance of technology in activating and maintaining emergent social behavior in times of crisis, especially as it relates to pre-existing relations of resistance. To a certain extent, the emergence of some groups does rely on existing social relationships, as characterized by grassroots networks utilizing virtual communication as an organizing strategy.

The preliminary findings presented here suggest that much of the convergence on New Orleans followed the activation of grassroots networks by residents on the ground, as well as network mobilizations from outside of the city. This convergence resulted in various emergent groups that formed soon after impact. In this sense, the activation of these networks did not occur unidirectionally, that is, from the local residents to the globalized network. Rather, the activation moved across geographic scales. As mentioned earlier, some emergence cannot take place in isolation from the existing social relations that permeate material and virtual grassroots networks across geographic scales.

Setting, Research Methods, and Methodological Issues

The findings presented in this paper are based, in part, on initial ethnographic fieldwork conducted through a quick-response research grant following Hurricane Katrina. In this study, I employed qualitative methods including informal and in-depth interviews, participant observation, and systematic collection of movement-produced documents.

With respect to participant observation, these methods provide important descriptive data that will situate the interviews within a specific historical and cultural

context (Fine 1999, Lofland and Lofland 1995). In addition, participant observation provides access to many of the implicit group meanings and values that characterize social movement groups (Lichterman 1996, 1998; Taylor 1998).

Data were gathered through three phases of extensive and intensive fieldwork in the impacted area of New Orleans, Louisiana. I spent five days observing and conducting informal interviews in New Orleans in early October 2005, as the initial phase of the research project. Initially, the research questions surrounded the ways emergent groups perceived and participated in the postimpact response and early recovery efforts. In November 2005, I made a second trip lasting 11 days. Finally, a third and significantly longer phase of field research in New Orleans, lasting roughly five months, began the first week of January 2006.

I entered the field to collect perishable information on emergent group activities during and immediately following the disaster. I conducted fieldwork in various neighborhoods such as the Tremé, the Upper Ninth Ward, the Lower Ninth Ward, Uptown, Central City, and New Orleans East, as well as St. Bernard Parish, which borders Orleans Parish.

During the initial phases of research, participant observation was the primary source of data collection because many of the relief workers and activists who converged on the city were fully mobilized and engaged in important disaster relief tasks. Through participant observation, I gained entrée and engaged in a variety of activities with the relief workers, organizers, and activists, such as relief and supply distribution, tarping roofs, washing dishes after community meals, distributing flyers by bicycle, attending community and neighborhood association meetings, marching in organized protests, riding bikes in critical mass through the city streets, and walking with a second-line jazz funeral through the Tremé neighborhood, one of the first instances of this traditional activity to take place after the hurricane. Other activities included cleaning mold-stricken homes, picking up trash on the streets, and removing debris from the roadways. At times, I slept in tents located behind distribution centers in residential backyards or inside massive volunteer housing in a warehouse on the edge of the Ninth Ward.

As the disaster phases shifted from response to recovery, I slowly prioritized one-on-one, semistructured, elite interviews with key respondents to determine how the groups initially formed, how the individuals became involved, and their experiences in response and recovery activities in New Orleans. Additional respondents were recruited through a snowball sampling method. However, the interview conditions remained challenging and on several occasions interviews were interrupted when more pressing issues arose related to fulfilling important disaster relief tasks. In this sense, many of the interviews are incomplete and fragmented,

without a clear beginning or end, and, in some cases, demographic information on interviewees is missing. While I tried to follow up with respondents following the interruptions, several could not be found. Even though some data were lost, the disruptions also have the potential to provide insight into the nature of emergent behavior through fieldwork in uncontrolled and highly dynamic conditions. These disruptions reveal the extent to which intense response and recovery activities extended well past the initial disaster impact, the tendency of volunteers to prioritize relief activities over research activities, and the fact that many disaster volunteers were highly transient.

To date I have conducted a total of 74 in-depth, one-on-one, semistructured interviews with participants in various relief and early recovery efforts and with participants in groups that formed after Hurricane Katrina. The data presented here come from field observations and interviews with 24 participants in groups that emerged during the immediate post-impact response period. The average interview lasted just over 60 minutes. The interviews are currently being transcribed and coded and, thus, the interview data presented here are used selectively to demonstrate and illustrate the various types of emergent activities that occurred following Hurricane Katrina as relating to resistance and justice-oriented grassroots organizing.

I struggled to overcome many challenges during the course of fieldwork. My mobility was often restricted due to blocked access to certain neighborhoods through security checkpoints set up at various locations in the city, as well as the enforcement of curfews. Normal ferry travel across the Mississippi River was disrupted and commuter boats were running on restricted hours.

Resources such as food, water, and fuel were limited in the affected region. Because of the extensive disruption of transportation, I conducted most of the fieldwork by bicycle, riding through debris-covered roads, and dismounting when necessary upon encountering obstacles in the streets. While I did not keep track of mileage during the first two trips, during the extended five months of subsequent fieldwork beginning in January 2006, I traveled well over 1,715 miles by bicycle.

During the initial stages of research, several areas where I carried out fieldwork were without electricity or potable water. Instead of writing field notes electronically, I used pen and paper to write as much as possible and then expanded electronically when I gained access to power for my laptop. It was not uncommon to travel several miles by bicycle before finding a business with a reliable power source and, on numerous occasions, buildings would lose power while I was writing, further demonstrating the fragile infrastructure of the city at the time I conducted fieldwork.

Emergent Groups in Emergency Times

My analyses are centered on the cultural dimensions and practices of emergent groups in relation to wider emergent phenomena in post-Katrina New Orleans. The data presented consider the cultural dimensions of emergent citizen groups, that is, the localized practices that emerge within a given time and place, as well as the subjective experiences of participants in the behaviors.

In part, the analyses serve to support and validate arguments by Rodríguez, Trainor, and Quarantelli (2006) that many of the behaviors following the storm were creative, constructive, and indeed, prosocial in nature. However, the analyses also emphasize emergent and organized patterns of collective resistance that sought to counter the negative media portrayals of antisocial behaviors following the storm. As the data reveal, particularly with respect to community policing of law enforcement agencies, some of the emergent behavior was produced in direct relation and resistance to the imagery employed by media and law enforcement officials. Rather than being oppositional, this type of emergent behavior was enacted in resistance to the widespread portrayal of antisocial behaviors following the storm and in direct relation to various structures of power and authority. Thus, the framing of antisocial behavior by the media and institutional authorities, to some degree, influenced some of the emergent behaviors that occurred in New Orleans as a few groups actively resisted the hegemonic discourses presented to the public.

The data and analyses on emergent groups relating to grassroots networks are presented in four sections: (1) Early Responders: Street Medics on Bikes; (2) Emergent Group Policing of Law Enforcement Activities; (3) Relief, Recovery, and Flood Bikes; and (4) Negotiating Insider and Outsider Status in Disaster. These four sections highlight a range of emergent group activities and behaviors in the crisis period of the New Orleans disaster as related to organized resistance practices.

Early Responders: Street Medics on Bikes

One emergent group, which later developed into the Common Ground Collective, was initially organized by four white individuals who converged on New Orleans on September 8, 2005, after answering requests posted via electronic listservs by a local black resident for progressives, activists, and organizers to converge on the area to help in the response and relief efforts. About the same time, several converging activists of color were denied access to the city at various military checkpoints. In addition to requesting volunteers to engage in more traditional disaster-related tasks, the resident, a veteran Black Panther, mobilized peacekeeping efforts aimed at reducing racial tensions and violence by white vigilantes self-policing the unflooded Algiers neighborhood just after the disaster impact.

While this convergence occurred more than a week after the impact, the conditions on the ground still constituted an ongoing emergency. In the wake of Hurricane Katrina, Hurricane Rita made a September 24, 2005, landfall on the Texas-Louisiana boarder, forced a second evacuation of the region, and re-flooded portions of New Orleans. Within the context of an ongoing emergency period, several early responders organized to provide immediate medical relief to residents still in the affected areas. Even more, the scale and scope of the disaster also produced the context for emergent civilian peacekeeping and anti-violence efforts. A local resident reports, "Those are heroes. You'll never hear the Mayor, or anyone talk about them. But they (the early responders) literally stopped this city from breaking out into a race riot."

Three of the individuals were licensed emergency medical technicians (EMTs), and the fourth person performed important organizational tasks as the small group set up a free first aid station in the unflooded Algiers neighborhood. Within a day of arriving in the Algiers neighborhood, the emergent group had set up a makeshift first aid station in a mosque secured by the local residents in the neighborhood. Permission to use the facilities as a site for response activities was granted by residents who were part of the religious community. One of the early responders recalls the first days (September 9, 2005) on the ground:

> *When we woke up, we opened up the space and we put out a sign saying "first aid station." (A local male resident) had gotten some bicycles. So, we started going in shifts, me and the other medics, getting on the bike and just riding around the neighborhood and going up to people on their porches. The minute we saw anybody we would tell them where we were and if they needed any medical attention or supplies they should come to us. Folks started telling us of their shut-in relatives . . . and we started making house calls.*
>
> *But I was very hesitant because I was an EMT after 9/11 and I tried to go to New York City to help but when I finally got through to anyone they said, "We have enough rescue workers here. We have too many. Don't come. Don't come. Don't come." And in any formal disaster relief training they really emphasize, "never self-deploy, never self-deploy."*

The early medical responders report making house calls to engage in tasks like taking blood pressure, testing for diabetes, and checking for a wide range of symptoms and conditions experienced by residents. Yet, the aid workers were not working in isolation, and the four early responders immediately began working with two local residents as part of the outreach efforts to make their presence and services known to residents in the area. They, along with local residents, quickly developed a name: the Common Ground Collective. This name was immediately

incorporated into signs, a website, and informational material that was distributed to residents, press, and emergency management officials. In fact the group size grew considerably within a very short period of time as additional activists, organizers, and residents heard of the clinic and relief efforts. One year after the Hurricane Katrina landfall, the Common Ground Collective has a sustained presence in New Orleans with donations and thousands of volunteers pouring in from across the nation and even internationally. Publication of the early history of the Common Ground Collective has already occurred (Horne 2006) and therefore will not be repeated here. This chapter will focus on the emergence of new behaviors and groups during the disaster.

This emergent group also negotiated relationships with existing emergency response organizations deployed in the area. The respondent continued with a description of an interaction with federal officials who questioned their presence at the religious site and their relationships with local residents.

> *And then the [federal troops] showed up quite rapidly when they saw us going into people's houses because they were going around at the time, knocking on people's doors in Algiers. They were doing a census. They were trying to find out how many people were still there. When they saw us getting access to people's houses with [names of two local female residents], and just talking to people on their porches, a Civil Affairs unit stopped by the mosque. And they were just totally perplexed. They said, "How did you get access to the mosque? How are you getting access to the interiors of peoples homes? You know, we come knocking on the door, they [residents] are not answering the door."*
>
> *We said we were asked to come here by someone in the community who attends this mosque and we were going around initially with people from [emphasized] the community . . . and we don't have guns.*

The out-of-state, male respondent emphasized on several occasions throughout the interview that the medics did not carry guns and this unarmed status helped develop trust with residents in the area. As the first aid station formalized into a more organized medical clinic, with hundreds of volunteers converging at the clinic site over the subsequent months, a sign posted on the outside walls read "No Guns," a symbolic statement to the local community about the role of (unarmed) responders to disaster situations.

A second early responder, another out-of-state male, also commented on the benefit of entering the area unarmed:

> *I think a lot of it was that, for a lot of folks, we were the first relief that they saw that didn't have guns, pointed at them while they were like [in the voice of an*

> *armed emergency responder while motioning with hands as though looking down the barrel of an imaginary gun] "No! We're here to help you, we promise. Just don't move too fast!"*

The second respondent also commented on using bikes as an innovative means for providing immediate medical relief and first aid to residents in the community:

> *The immediate relief work, as far as the clinic went was . . . a lot of it initially was taking the one bike we had, until we got more bikes, and one of us would go out on bike. Two people would stay and treat. And [name of early responder] makes runs in the van we had over to West Jefferson hospital with patients, essentially using white privilege to get through the checkpoints, to get people to where they could get prescriptions.*

Again, mobility is of extreme importance, both in its facilitation and restriction of relief work and justice-oriented activities. Innovative uses of transportation enabled relief work through outreach strategies to actively locate affected individuals rather than waiting for these individuals to seek out medical attention. In addition, the responders also report using existing race relations, and in the respondent's own words "white privilege," as a strategy to move *willing* residents through checkpoints to seek medical attention at the few open medical institutions in the area. In a highly sensitive disaster situation saturated with events that displayed the racialization of mobility (including forced migrations and involuntary evacuations), an acute awareness of race relations, specifically the institutional and interactional benefits of "white privilege," facilitated instances of rogue style relief, mutual support, and the pursuit of justice for residents of New Orleans.

When asked about how the first aid workers were received by local residents, the second respondent reflected on the casual and unthreatening nature of alternative modes of transportation, as seen by those still present in the affected areas.

> *I think it was just like . . . more laid back. I mean we kinda just stopped, you know, it's like you're leaning on somebody's fence chatting them up rather than pulling up and getting out of your vehicle. Even if it's a rickety vehicle, you know, who the hell has gas? There ain't no gas stations. I think it was more the fact that, you know, it made us more able to stop and talk to everyone and go down streets that a car couldn't because of debris. I mean there wasn't much traffic, except for the military, so you could bring your bike everywhere.*

In addition to providing human-powered mobility in a situation where local fuel and vehicle services were at the time almost nonexistent, the alternative transportation also served to diffuse residential perceptions of the potential for criminal

activity by early responders. For example, rumors began circulating that individuals posing as EMTs were engaging in forced entry and robberies. However, the second street medic describes the ways that a bicycle invokes a different reaction from the residents:

> *People were sitting on their porches, they'd see us come up on a bicycle and just be like, "Well you don't have any way to carry anything off with you." I mean I think it is just like a change from the typical. You know, we are not arriving in an ambulance, lights blaring. We're rolling up with the fenders kinda clattering.*

To some degree this account also demonstrates an expanded emergent phenomena category described as "emergent groups with latent knowledge" (see Vigo and Wenger 1994); the street medics who converged on the city were trained to provide immediate medical attention at mass demonstrations in North America such as the WTO in Seattle or the Republican National Convention in New York City. Yet in these unique circumstances, the action medics used their prior first response training in another unsecured situation, the disaster setting, while still adhering to larger social justice projects of mutual support.

Emergent Group Policing of Law Enforcement Activities

While much disaster literature has focused on how individuals converge on disaster sites to help in relief and recovery work, less attention has been paid to efforts by civilians to maintain peace, justice, order, and accountability of the state apparatus, including criminal and legal processing, in disaster situations. Following Hurricane Katrina, emergent group efforts to police law enforcement activities in the periods immediately following the disaster surfaced as an important dimension of the civil society contribution to the recovery efforts. The breakout group of justice-oriented relief workers described below is only a fraction of a massive influx of volunteers, students, religious groups, organizers, and activists to converge on the city of New Orleans in the period immediately following Hurricanes Katrina and Rita to engage in important disaster response and early recovery activities. Yet, this smaller number of justice-oriented groups organizing in crisis situations sought to meet the needs of individuals navigating the milieu of contested social relations of power that surfaced between media portrayals of unruly citizens (images saturated with racist and classist sentiments), institutional authorities such as local, state, and federal law enforcement agencies, and the residents who survived the storm.

The following example of emergent behavior illuminates issues concerning the role of civilians and the state in responding to crisis situations. On Saturday, October 8, 2005, just weeks after Hurricanes Katrina and Rita struck the city of New



FIGURE 1: Entrance to Camp Amtrak. Photographed by author.

Orleans, Associated Press reporters filmed the graphic beating of a local resident at the hands of three officers from the New Orleans Police Department (NOPD). Shortly after the filmed beating took place on the streets of the French Quarter, Robert Davis, a 64-year-old African American retired school teacher, was brought to a makeshift jail dubbed "Camp Amtrak" in the city's bus and train depot on Loyola Avenue and charged with public intoxication, simple battery, and public intimidation. The three NOPD officers involved were white. Upon arrival, Davis was welcomed to Camp Amtrak by a flattened cardboard box taped to the glass doors at the terminal's entrance with the following words scribbled in black marker: "We are taking New Orleans back." See Figure 1. The sign also points to emergent behaviors on behalf of those running the temporary facilities. They creatively declared their institutional authority to reclaim the material and symbolic control of the city.

The sign posted at the temporary jail was consistent with the police violence that occurred that evening, and it forcefully declared that the existing power structures were set on restoring order to the city, and to the criminal-legal complex itself.

The Katrina catastrophe revealed to the world the fragility of centralized, institutional powers in times of crisis, and the criminal-legal complex was no exception.

It is within this temporary window of institutional crisis and structural opportunity that everyday people, many of whom have long imagined that positive social change was possible, began organizing in emergent groups in the pursuit of a safer, more just world. That same evening, without knowledge of the beating, a small group of young, mostly white, relief workers concerned with prisoner rights sat on the grounds of an unlit field in the unflooded Algiers neighborhood on the west bank of the Mississippi River. They discussed strategies to address what the group perceived as discriminatory arrest practices and police abuse in the crisis period following the storms. A sense of caution was apparent as National Guard vehicles patrolled the neighborhood with strobe lights flashing. More so, there was a sense of urgency as the perception of an "occupied New Orleans" extended well past the initial impact phases of the disaster. The discourses circulating among many of the residents, volunteers, and activists questioned the portrayal of looting in the media and numerous suspicions arose regarding differential and discriminatory arrest patterns that were seen as disproportionately affecting poor residents and people of color. Sentiments expressed by several of the prisoner-rights supporters suggested that the subsequent response by law enforcement officers might have been affected by media portrayals. Thus, emergent groups responded in an effort to hold law enforcement agencies accountable for postdisaster arrest activities, especially those practices that were perceived as racist or classist in nature. In this sense, the emergent behaviors described here were produced in a critical response and resistance to what some have called "negative media framing" (Tierney, Bevc, and Kuligowski 2006; Rodríguez, Trainor, and Quarantelli 2006).

A few of the participants in the emergent group were already familiar with community-based policing programs in their respective hometowns and these mostly out-of-state prisoner-support activists envisioned empowering New Orleans residents through the development of similar community programs aimed at curbing law enforcement abuses and deescalating tensions between police and residents. Moments into the strategizing session, two NOPD police vehicles approached the group and parked with headlights illuminating it. After a period of intense questioning by officers about the ownership of a nearby abandoned car, the handful of civilians managed to deescalate the situation by emphasizing their status as volunteers at the nearby Common Ground Collective health clinic that had been set up in the days immediately following Hurricane Katrina (as described in the preceding section).

By the following morning the group had gathered a few additional volunteers and I joined them on a drive across the Crescent City Connection over the Mississippi

River to Camp Amtrak to speak with released arrestees about their treatment in the makeshift jail as they exited the temporary facilities. What began as simple informal discussions between newly released inmates, prisoner-support activists, and independent media journalists organically turned into a more systematic effort by the activists to conduct exit interviews documenting conditions within the facilities. The group conducting the interviews was composed of mostly young people—both male and female, whites and people of color. They asked newly released inmates about their experiences with law enforcement and Camp Amtrak conditions, and scribbled the responses in notebooks and on loose-leaf paper.

On the afternoon of Sunday, October 9, 2005, around 2:30 p.m., Richard Davis, the man who was beaten, was released from Camp Amtrak and sat among a row of seats outside the front doors of the depot while waiting to return home, the cardboard declaration looming over his shoulder. The prisoner-rights activists and independent media journalists documented his account of his treatment before network stations were even able to contact him. This brutal incident, alongside the death, devastation, and resulting diaspora portrayed on televisions across the world, fueled global discussions of race and inequality in post-Katrina New Orleans. It is within this context of heightened (in)security, race and class tensions, violence, residential safety, and patterns of systemwide government failures that this group emerged to respond to the negative media frames that portrayed widespread antisocial behaviors and corresponding responses by law enforcement officials.

The prisoner-support activists continued their presence at various processing facilities in New Orleans on almost a daily basis through at least late November 2005, a period during which the city's criminal processing made the transition back to intake facilities at the once-flooded Orleans Parish Prison (OPP). At times, bilingual activists even served as translators at the processing facilities for Spanish-speaking residents caught up in the criminal-legal system. Emergent citizen groups tend to organize around perceived needs or problems (Stallings and Quarantelli 1985) and this particular group mobilized in response to real or perceived issues of law enforcement differentially targeting the poor, people of color, and non-native English-speaking residents. The groups also responded to circulating discourses that Camp Amtrak became the site of inmates being subjected to forced labor practices. In this sense, some prosocial emergent group activities developed to actively resist the negative media framing of antisocial behaviors.

In addition to continued visibility of prisoner-support activists, there was discourse circulating among a network of grassroots organizers engaged in postdisaster relief work about how to deescalate potentially violent encounters between residents, relief workers, and law enforcement officers in a sensitive

context that has been characterized by some as a highly militarized disaster setting (Tierney, Bevc, and Kuligowski 2006). This narrative description about emergent groups developing innovative strategies to hold law enforcement officers and, more broadly, the state apparatus accountable for their actions through various watchdog activities briefly highlights just one of the many types of important, yet underresearched, disaster tasks that nongovernmental emergent groups engaged in during the postimpact phase of the catastrophe in New Orleans. In effect, attempts by civil society to hold the state apparatus accountable in times of crisis illustrate how power relations are radically contested in pursuit of the fair and just treatment of residents of an impacted area.

Relief, Recovery, and Flood Bikes

Other existing organizations took on new tasks immediately following the hurricane that mark another type of organizational phenomena. For example, Plan B: The New Orleans Community Bike Project, an organization that existed prior to Katrina, offers a tool library and a workshop for building and fixing bicycles. This organization took on new roles during the relief and recovery phases of the hurricane by building and distributing bicycles to residents, relief workers, and volunteers (hence a Type III organization, i.e., an extending organization). The bikes were not necessarily in riding condition, as many of the recovered bikes sat in floodwaters for several weeks. To this end, local bike mechanics spent whole days and nights working on bikes to distribute to the community.

The bike mechanics transformed their workspace by bringing in coffeemakers and food-storage containers to accommodate the increased time spent in the shop. By mid-October 2005, hundreds of bikes were donated from bike shops in Chicago and Morgantown, West Virginia, and shipped to New Orleans. The bikes were sold three days a week outside the workshop in the Marigny neighborhood just downriver from the French Quarter. The bikes were priced at $15 dollars each to cover costs of parts. Sales were often informal, with customers overpaying, or in some cases receiving the bikes for smaller monetary donations. In terms of bike distribution, priority was given to residents in areas most affected by the storm and the flooding. On several occasions members of the bike project donated bikes to various community groups after fixing them, or loaded the bikes for drop off in harder-hit neighborhoods.

According to their records, which are handwritten on pieces of paper, the group sold roughly 20 bikes each day for three days a week between October and December 2005. The organization's records also indicate bicycle sales to producers from national news organizations and professors from nearby universities, as well as members of the local police department. However, as word spread of the bike

project, contractors, day laborers, and relief workers also began arriving. As the demand for affordable transportation rose, the bike mechanics began to limit sales because they were selling the bicycles at a faster rate than they could build them.

Outside the shop, many bicycle enthusiasts would engage in rescuing "flood bikes" from the piles of debris and spend hours, even days, making the bikes usable again. In terms of the activities within the community bike project, these examples exhibit forms of *task emergence* (Quarantelli 1996) that formed in the context of Hurricane Katrina. At the organizational level, the group could be characterized as an extending organization (Type III) in which the group performs new tasks within the existing structural arrangements. However, this characterization must be qualified, since several bike mechanics also converged from around the country to build bicycles as their contribution to the relief and recovery efforts after answering requests posted electronically.

This activity was not limited to the workshop in the Marigny neighborhood. In fact, observations made through extensive field research suggest that the prevalence of bike recovery and distribution was a widespread phenomenon in the disaster setting. Smaller bike recovery and distribution projects emerged in informal, residential distribution centers in areas as diverse as Algiers, Tremé and the Seventh Ward, the Ninth Ward, and in Arabi in St. Bernard Parish.

Those individuals with vehicular transportation often held the responsibility for moving activists, relief workers, and residents to and from worksites or for delivering important resources like tools, information, and meals to various locations. The reliance on automotive transportation created relationships of dependency in which power was unequally distributed to those with material access to vehicles. Yet, if vehicles became a source of power and control, alternative modes of transportation became potential sources of resistance and autonomy associated with the ability to move through the city. The donation of hundreds of bikes by cycling groups nationwide, as well as through communally shared bicycles, enabled activist relief workers to circulate the city streets without dependency on fuel, vehicles, or vehicle owners. While this form of mobility privileges able-bodied individuals, the practice of riding bikes through the disaster setting relieved many of the pressures put on vehicle owners to transport relief workers throughout the city. Lastly, many of those activists and volunteers who rode the streets of New Orleans by bicycle displayed undercurrents of "green" activism. With respect to these attitudes and countercultural practices, even the emergent practice of bicycle mobility in disaster relief and early recovery is situated within the larger environmental justice movement.

Convergence, Emergence, Space, and Place: Emergent Groups Negotiating Insider/Outsider Statuses in Disaster Zones

The resistance in New Orleans in the wake of Hurricane Katrina was strategic and often articulated in relation to more traditional forms of disaster volunteerism. An interesting feature of convergence and emergence in this particular disaster was the extent to which being from New Orleans or converging from outside the city affected the experience of the group participants. These social markers often required participants to critically reflect on their own status positions while volunteering in the affected area. Other research findings presented here include the personal and emotional impacts on converging members of emergent groups as they negotiated various lines of difference. Some volunteers in the emergent groups studied reported grappling with issues of race and class privilege, ethnicity, gender, and religion when providing immediate relief and recovery work to historically underprivileged areas of the city. Other individuals reported facing similar challenges in negotiating identity in terms of space and place. Often volunteers in the emergent groups grappled with their status as "outsiders" and at times went to great lengths to minimize the perception that they were participating in charity work—a concept that, for many participants, marked a condescending effort to help those who could not help themselves.

This sensitivity to a perceived outsider status is negotiated on many fronts both individually and organizationally. For example, one young woman reported that riding bikes through devastated areas seemed less intrusive than riding through the same neighborhoods in a car. Her perception of intrusiveness supported the discourses circulating within the group that touring the devastated area was a profane transformation of the local tourist economy linked to an emerging industry of disaster tourism. Therefore, this West coast college student, a white woman, commented on her own efforts to minimize (the perceived and real) discomfort to local residents through her volunteer presence. She modified her behaviors in order to negotiate her sensitivity to race, mobility, and place during her volunteer work in the Ninth Ward.

Another volunteer in a formalizing emergent group reported reading an e-mail prior to her trip to New Orleans that cautioned about the unintended effects of white volunteers and activists converging on historically black neighborhoods as part of the relief effort. In large part due to this e-mail, she considered not traveling to New Orleans. This 27-year-old, multiracial woman attending college in the Northeast expressed her hesitations with respect to outsider status:

> *I got this e-mail before coming here and it was a lot . . . it made me, like, really scared to come at all. Because it was basically like, "what are white people actually doing there, they shouldn't be there . . . so if you can afford to get down there, why*

> *don't you afford to fly someone home to take care of their house instead." And like all this like weird, weird . . . like it's true. What the hell are we doing here? And one person in the e-mail was like, almost as if, she thought it was almost as if it was giving some activists or activist types or whatever, were giving the city something that it didn't already have, which was some sort of activism. Like, almost as if like, "you don't know any better. Let's show you about activism." You know, when it probably does have a lot of it. I mean it's the South.*
>
> *I haven't seen that from people yet, nobody that I've worked with. But I can see how that can very easily be. Somebody coming in and being, like, "I'm leading you now."*
>
> *I'm a mix too, so it makes it even more conflicted. Not necessarily black or white, but just a mix. But some people see me as white and some people see me as not white. But for the people who do [see me as white], I don't want to be part of the white knight solution.*

These moments of negotiating a racialized self relative to place-specific social relations rooted in histories of racial and class-based inequality, demonstrate the complex layers involved at the cultural and interpersonal levels of individual experiences as activists and volunteers participating in disaster stricken areas. These quotes also demonstrate the importance of "place," local and even regional understandings of place, for the experience of participants in emergent groups, in that many had not visited these communities prior to the disaster and spatial points of reference were often limited to the postimpact setting.

Organizationally, some emergent groups addressed issues of race and place through anti-oppression training and engaged in efforts to diversify the composition of core membership through mutual aid efforts with residents. In exploring issues of emergence and convergence, it is also important to recognize the potential disjuncture between the collective visions (i.e., goals and aims) of the grassroots globalization networks, as plural and fragmentary as they might be, and how the collective visions materialize on the ground (i.e., the reception of these aims) for both activists and residents that call the impacted area "home." A brief discussion is needed to address how those at home (or displaced from home) experience convergence, emergent groups, and movement participants, especially when the visions and activities affect material conditions on the ground.

It was not uncommon for local activists and residents in New Orleans to perceive many of the visiting activists and volunteers who converged on the city as outsiders to their communities despite concerted efforts to engage in solidarity work and mutual aid. I am not arguing that everyone experienced these reactions in a consistent or unified way. Indeed mutual support and solidarity efforts resulted in

alliance building across many lines of difference. Rather, many of the activists and volunteers report perceiving themselves as outsiders and visitors to these communities. The construction of the insider/outsider phenomena forced individuals to negotiate an "us vs. them" mentality in subtle yet powerful ways.

There are many lines along which relationships of power were uneven; the most obvious are race, class, and gender. However, relationships were also contested based on time-space interactions, with a particular focus on residency, home, and length of stay in the impacted areas. Naples (2003) argues that the insider/outsider dichotomy is actually a contested separation because it overlooks the processes through which the terms are constructed and employed in various contexts to undermine or reinforce power relations. Rather than seeing the insider/outsider position as essential, that is fixed or static, which for some individuals would gain them access to "privileged" ways of knowing or immediate access to certain communities or subcultures, Naples focuses on the fluidity of the insider/outsider subject positions as processes that are negotiated through interaction.

For many participants in emergent groups in New Orleans, the insider/outsider status was constructed in various ways, but especially with appeals to place, home, residency, and duration of stay in the impacted areas. For example, those participants who became core members of the emergent groups as they formalized and ended up residing in New Orleans for greater lengths of time were often granted more insider status than those who were only visiting for shorter amounts of time. For some there were status shifts from outsiders to insiders. Additionally, those who called New Orleans home (and more specifically, referring to residency before the storm) constructed their insider status in relation to visiting activists and volunteers.

While the insider/outsider status issue was constructed within the spaces of emergent groups and through interpersonal interactions, there was also sensitivity to the outsider status of the visiting activists and relief workers to the existing community activists and residents. Antiracist training and workshops were conducted in order to minimize the potential risks of creating and reproducing unnecessary tensions between locals and outsiders, and to address these issues *within* the movements. In effect, these workshops demonstrate the extent to which the converging volunteer population for this formalized emergent group reflected a disproportionate number of white, out-of-state volunteers in relation to the demographic composition of New Orleans prior to Hurricane Katrina.

In a ten point brochure distributed in November 2005 titled "Points for Visiting Activists to Consider . . . ," self-identified local activists offered suggestions for respecting residential communities. They wrote:

> *It is crucial at this point for returning New Orleanians to feel like they are coming home to the city they left, not to a strange place filled with well meaning, but unfamiliar people who don't know our culture or our city . . . The point is that if we, the segment of the population most likely to identify with visiting hurricane relief activists, is* (sic) *made to feel alienated in our own hometown, imagine how unwelcome those who are less culturally aligned with you as well as less privileged may feel as they finally make it home.*

In addition to the sensitivity between visiting activists and residents, this brochure demonstrates discussions on the relations between visiting outsider activists and local activists. Another point in the brochure addressed the conflict between these grassroots globalization networks and the notion of home for the local radical activist community:

> *There was a radical community in New Orleans before the hurricane hit and there will be one after you leave. Even though you might recognize us from protests, summits, or festivals, please keep in mind that WE LIVE HERE. When you meet someone for the first time who fits your demographic, please don't greet them in a way that assumes they are not from here such as, "Did you come over from Algiers?" or "Where are you from?" Instead, try asking, "Do you live here?"*

It is important to recognize that while participants in grassroots networks move through convergence practices and, in this case, participate in emergent groups following disaster, they most likely also return home. As the statement in the brochure demonstrates, conflicts arise when the convergence is experienced "at home." Implicit in this suggestion made by members of the local radical community is a sense of permanency and stability surrounding notions of place set in relation to predisaster and postdisaster conditions. The return to notions of place reminiscent of predisaster conditions is imbued with nostalgia for these activists and exhibits what Massey calls a "defensive reactionary view" of place that functions to enclose boundaries around a certain "sense of place" (1994, 154). This defensive approach also is problematic in that "the identity of place—the sense of place—is constructed out of an introverted, inward-looking history based on delving into the past for internalized origins" (Massey 1994, 152). For the authors of the brochure: the activists live here, the visiting activists do not. The construction of insider status with privileged access to the prestorm "unified" radical community in New Orleans implies the temporal dimension (participation before the hurricane hit) and the spatial dimension (residency in New Orleans proper, not Algiers on the West Bank). To this extent, the convergence at home produces another set of contested relations.

It is important to note that just because the local activists are engaging in movement activity does not mean they are not affected by the destruction of home. Many from New Orleans are living in a state of seemingly perpetual dislocation. In fact, at the time of these observations, for many of the local activists in the radical community the convergence became "home." In this sense, the convergence *is* home, even if temporarily, and thus there tends to be a conflict in theorizing the two notions in opposition. This, too, demonstrates a false separation because for the time being, convergence and home are conflated.

This brochure, distributed at a November 2005 action for relief organized by the Common Ground Collective, demonstrates the limitations to the current theorizations of emergent groups in relation to convergence spaces, which tend to leave out discussions of contested relations between the grassroots mobilization networks and those outside of those networks, on the one hand, and those who make the networks their homes, on the other. Though not necessarily in opposition to the grassroots networks, the interactions between mobile activists in convergence spaces with existing activist communities and residential communities following major catastrophes creates another dimension for contested and uneven social relations of power.

Discussion and Conclusions

Research on organizational responses to Hurricane Katrina can inform understandings of disaster and collective behavior. This chapter contributes both theoretically and empirically to models of emergent behaviors and emergent groups in catastrophic situations. Theoretically, this chapter serves to explore notions of emergent resistance and oppositional practices in various phases of disaster. Emergent groups in disasters are generally not characterized as challenging or opposing official response agencies (Stallings and Quarantelli 1985, 98). Here, however, the action medics, prisoner-support activists, bike-riding environmentalists, and other examples in this chapter illustrate the "inevitability and pervasiveness" (99) of emergent groups in addressing a wide range of relations of power, authority, and civil society in emergency situations and the subsequent response and recovery efforts. Other activities of emergent groups observed in post-Katrina New Orleans can be further organized into two subcategories of emergence: consensus crisis activities and resistance activities. Consensus crisis activities observed in New Orleans included partnerships with local law enforcement officials and disaster relief coordinators, the development of community legal and medical clinics, the creation of women's resource centers and shelters, gutting of flooded homes, and trash and debris clean-up. Emergent resistance activities observed in New Orleans included public housing and tenant rights mobilizations, no-bulldozing actions,

anti-eviction campaigns, marches for human rights and the right to return for all displaced residents, environmental actions and protests of "toxic" landfills, local pirate radio projects, right-to-vote marches for displaced residents, political actions by the antiwar movement linking the Katrina catastrophe to the second war in Iraq, and in general, more long term involvement in disaster mitigation, political reform, and revolutionary movements.

The preliminary findings presented in this research suggest that the Hurricane Katrina disaster and the subsequent governmental and nongovernmental responses have motivated volunteers, activists, and residents to participate in civic life and political areas through the development of innovative behavior in relation to various environmental, social, and political demands. Even more, white relief workers, liberal reformers, and progressive activists, many of whom converged from out-of-state, are negotiating race relations, as well as their own racial identities, as visiting volunteers and activists to historically diverse and culturally rich neighborhoods affected by the catastrophe. As demonstrated above, several respondents question their participation in relief and recovery activities because of perceived racial differences and outsider statuses.

Organizational responses are affecting change in post-Katrina New Orleans through civil society measures and resistance movements. Given the magnitude of the catastrophe, it is important to recognize that the groups are working on different scales of social and political action, including efforts to combat racism and inequality and restore justice in many dimensions of response and recovery activities. This emergence of disaster-related resistance movements, as well as the convergence of college students and progressive activists, has the potential to rejuvenate left politics in the United States in movement actions reminiscent of Freedom Summer of the 1960s (see McAdam 1988), the peace and antiwar movements, the feminist movements, and the environmental movements.

The long-term consequences of mobilizations are yet to be seen. More longitudinal research is needed to discuss the long-term implications of major catastrophic events on political cultures and grassroots organizing across the country. Additional research in New Orleans and future disasters can explore the internal dynamics of the emergent groups, their relationships to other existing groups, and their sustainability, transformation over time, or even dissolution.

As floodwaters filled the city, the effects of Hurricane Katrina made clear that mobility is of great importance to the safe evacuation of residents as well the types and locations of group emergence that occurs. The focus here on mobility in relief and early recovery includes methods of distributing medical supplies and aid to those most immediately affected. Following the storm, emergent groups in New

Orleans often dealt with issues of mobility through task innovation such as bicycle recovery, repair, and distribution in relief periods to address the needs of residents and relief workers who needed affordable and reliable transportation under circumstances of limited access to vehicles, energy, and services. The analyses described in this chapter point to the importance of transportation, access, movement, and mobility, especially as it relates to emergent groups participation in disaster relief and early recovery.

The empirical and theoretical work described in this chapter provides increased attention to the emergence of organized practices of resistance. Important lessons learned from the civil society response to Hurricane Katrina come from illustrations of the innovation and creativity of activist medics on bicycles providing aid and relief to the survivors of New Orleans, as well as advocacy work to maintain accountability of the criminal-legal complex in response to the prevailing discourses perpetuated by negative media framing. These examples, however partial, point out the importance of culture, civil society, and the pursuit of justice by emergent resistance groups in responding to catastrophes. In light of this discussion, New Orleans became the site where emergent practices of organized resistance served to remake, refashion, and rebuild a city.

Notes

1. The three officers in the case were indicted by a grand jury on March 29, 2006. By early April, charges against Davis were dropped.

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Structural Barriers to Using the National Incident Management System

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Abstract

The National Incident Management System (NIMS), based generally upon the Incident Command System (ICS), is the required approach for federal, state, and local disaster response. We found that at the federal and local levels, different organizations used varying degrees of NIMS. A number of organizational factors inhibited a broader use of NIMS during the response to Hurricane Katrina. These factors include a lack of training, a lack of understanding about using NIMS or ICS, a lack of "buy-in" to the use of NIMS, and a perception that other systems could work better. In addition, we show how many assumptions within NIMS ignore the great wealth of research related to organizational effectiveness and disaster research.

Keywords: disaster response, National Incident Management System, Incident Command System

Although required by federal law, many federal and local entities did not use the National Incident Management System (NIMS) and the Incident Command System (ICS) during Hurricane Katrina (e.g., Neal and Gaete 2006). In this chapter we show that a number of structural barriers inhibited their use during the

hurricane response. These barriers include training issues, organizational factors, and ungrounded assumptions about human behavior in disaster, each of which will be discussed.

Following the 9/11 terrorist attacks, the federal government initiated many steps to prepare our nation to respond to future terrorist attacks and other large-scale disasters. Major changes included the creation of the Department of Homeland Security (DHS) and the removal of the Federal Emergency Management Agency (FEMA) from cabinet-level status to inclusion within DHS. While these changes were taking place, the federal government reiterated that NIMS would continue to guide future comprehensive local, state, and federal coordinated responses. NIMS now requires that all local, state, and federal entities obtain specific training and use ICS during disasters. In fact, if any party does not subscribe to using NIMS, that party can have federal disaster funding withheld (National Incident Management System 2004).

The foundation of NIMS rests upon ICS. During the early 1970s, the fire services developed ICS as a means to more effectively coordinate response to wildfires and structure fires. Although two different variations of ICS developed and still exist today (i.e., FIRESCOPE, Phoenix model/incident management), they share a basic underlying rationale. First, the incident commander (IC) oversees the management of four basic functions of the event in the field: 1) finance, 2) logistics, 3) operations, and 4) planning. The person managing finance keeps track of the costs of the event; the logistics head locates and arranges the delivery of resources to the event; the person in charge of operations manages the basic response to the event; and the planner obtains and disseminates information to assist the IC's decision making process. Depending upon the event's size, one to five individuals can manage the IC role and the four different functions. Those from the fire services and some other related fields contend that ICS is well suited for a wide range of emergencies and disasters. Specifically, supporters of ICS contend that such characteristics as common terminology, a unified command structure, and manageable span of control make it applicable to managing anything from a small house fire to coordinating a large hurricane (Hall and Adams 1998, 14–15; also see Perry 2003).

The ICS structure serves as the foundation for NIMS. In addition to ICS, NIMS includes a unified command that provides a mechanism for various jurisdictions to come up with joint decisions on key issues. Also, communications and language are standardized during the response, and information is provided to the public through a joint information system. Finally, the NIMS Integration Center coordinates the training and standardized protocol for the use of ICS and NIMS during a disaster response. In short, NIMS is designed to provide a standardized and uni-

fied response to disasters at the local, state, federal, tribal, volunteer, and private levels (NIMS and the Incident Command System 2004; NIMS Fact Sheet 2006).

ICS and NIMS have become the key management system for disaster response in the United States. Although the reasons behind the strong support of ICS for disaster response are beyond the scope of this paper, the perception among many emergency responders is that "It works." Yet, little if any empirical, scientific, and objective analyses exist to demonstrate the effectiveness of ICS or NIMS. In the most comprehensive analysis to date on the topic, Wenger, Quarantelli, and Dynes (1990) question the utility of ICS during disaster response. They show that ICS operational philosophy is not grounded in any management theory, does not allow for coordination with outside agencies, cannot manage the typical intraorganizational coordination and communication problems during disaster, and does not provide the needed flexibility for disaster response.

A few studies suggest that ICS has some utility during day-to-day operations. For example, Cole's recent survey of fire officers in California found no weaknesses in ICS (Cole 2000). As a result of this survey, Cole concludes that ICS should become the basis of a standardized federal response system. Grabowski and Roberts (1999) contend that virtual organizations can successfully respond to disasters through ICS. Their paper stresses the importance of flexibility in disaster response, and ironically draws upon works by Drabek and Quarantelli related to emergence to strengthen their argument. Emergence occurs when a new group or organization forms to assist with the disaster. These groups or organizations develop new tasks and new organizational structure to handle the disaster (Dynes 1970). Bigly and Roberts' (2001) analysis of the day to day operations of a fire department found that ICS provided a flexible management system. Although they suggest that the ability to be flexible and even improvise exists within the ICS system for disaster response, they do not draw upon the disaster/hazard/risk literature to buttress their argument.

In sum, despite the prominence and popularity of NIMS and ICS in U.S. emergency management circles, there is a noticeable lack of research on these systems. Moreover, the few studies that have been done reach contradictory conclusions. Thus, our nation now bases its disaster response on a management system that has been subjected to very little empirical examination. Our study addresses this substantial void by assessing the extent to which NIMS and ICS were used by local and federal agencies in response to Hurricane Katrina. It also identifies key factors that may have inhibited the use of these systems in response to the hurricane.

Methods

To assess the use of ICS in response to Hurricane Katrina, we employed a "quick response," qualitative investigation. Specifically, teams of researchers visited Baton Rouge and New Orleans on two separate occasions: once about six weeks following the impact of the hurricane and again about a month after that. On both trips, data were collected in a triangulated manner—that is, we conducted interviews, made observations, and gathered various organizational documents.

Because disasters create ambiguity and require flexibility and emergence on the part of responders, qualitative research methods are particularly well suited for studying them (Phillips 2002). Qualitative approaches—including observations, interviews, and unobtrusive measures—recognize that social reality is processual and constantly changing, especially during times of major disruption such as disasters. These approaches seek to generate thick, rich descriptions of social processes as they unfold. Thus, in qualitative research it is necessary for researchers to enter the field as soon as possible after an event occurs to gain a better understanding of what is happening from the perspective of those involved. It is also important to enter the field quickly because much of the data that need to be gathered are perishable—that is, as time passes people's memories fade and their perceptions of the effectiveness of the response effort may change. Quick response research, therefore, is the best strategy for gathering perishable data (Michaels 2003). The remainder of this section will discuss: (1) sampling procedures, (2) methods of data collection, (3) data analysis techniques, and (4) issues of trustworthiness and credibility.

Sampling Procedures

Throughout the data collection process we employed a theoretical sampling strategy (Glaser and Strauss 1967). While random sampling techniques rely on equal probability of selection, theoretical (or purposive) sampling is based on relevance to the objectives of the study. Thus, respondents were purposively and strategically chosen because of their organization's involvement in the disaster response. Moreover, we sought to interview organizational representatives at all levels of government: federal, state, and local. Once we entered the field, we identified organizations involved in the response and interviewed available individuals from those organizations to get their perceptions on the use and effectiveness of ICS in the response. Snowball sampling was also used in selecting interviewees—that is, each respondent was asked to recommend others with whom we should talk.

Methods of Data Collection

We employed a triangulated approach to data collection in studying the use of ICS in response to Hurricane Katrina (Denzin 1978; Jick 1983). This approach to data collection involves gathering data on the same topic in various ways. In this project we used three primary strategies: interviews, observations, and document analysis. Our data gathering focused on observing behaviors and obtaining perceptions of different disaster management organizational representatives (i.e., fire and police; local, state, and federal governmental agencies; and volunteer organizations).

We conducted semistructured interviews (Lofland et al. 2006). This approach involves the use of an interview guide to ensure that major areas of interest are covered, but it is also very flexible, allowing respondents to provide in-depth information on topics about which they are most familiar. Our interview guide covered the following topics: the respondent's role within his or her organization, the timing and nature of the organization's response activities, levels and types of preparedness undertaken by the organization prior to the storm, interorganizational coordination during the response, and the respondent's perceptions of the use of ICS. Thus, participants in the study were treated as both respondents and informants—that is, they were asked to provide information on themselves and their organizations. Overall, we interviewed 30 respondents: 19 individuals that primarily focused upon the federal response and 11 organizational representatives involved in the local response. However, in some cases respondents were involved or had direct experience with both settings.

The field teams also conducted systematic observations at the Joint Field Office in Baton Rouge and the Emergency Operations Center and Area Field Office in New Orleans. These observations included descriptive, focused, and selective observations (Spradley 1980). The goal of these observations was to understand the "tacit" or taken-for-granted assumptions of various disaster responders and to assess the use of ICS from multiple perspectives. For example, we found that representatives from different agencies or from different levels within a single agency had varying perspectives on and knowledge of ICS.

Various organizational documents were also to be gathered by the field teams (Webb et al. 2000). These included press releases, organizational charts, memoranda, and after-action reports. These data were useful in helping us assess the degree to which ICS was implemented in the response, the specific ways it was employed, and the relationship between predisaster preparedness and the actual implementation of ICS in the disaster response. Additionally, these data allowed us to compare the assumptions about ICS made by various organizational managers with what we know about effective disaster response based on social science research.

Data Analysis Techniques

In qualitative research data collection and analysis take place simultaneously (Lofland et al. 2006). Observations and interviews conducted early on, for example, influence the collection of subsequent data. Our analysis of the data followed a grounded theory approach—that is, core analytic themes were identified as the data were being collected (Glaser and Strauss 1967; Lincoln and Guba 1985; Strauss 1987; Strauss and Corbin 1990). While in the field we processed data at the end of each day. Specifically, we entered detailed summaries of interviews into a computer, team members engaged in extensive debriefing sessions, and we crafted analytic memos. Our analysis followed what has been referred to as the "C-Model," which attempts to describe and explain the conditions, characteristics, and consequences of social phenomena (Phillips 2002). Throughout the analysis we focused on the central issue of the implementation of ICS. Thus, we analyzed the implementation of ICS in response to the hurricane, identified problems with and functional gaps in ICS, and assessed the degree to which disaster responders from different organizations perceived ICS similarly or differently.

Trustworthiness and Credibility

In quantitative research issues of reliability and validity are a major concern because data are typically gathered at one point in time. Thus, if the measures used on a questionnaire, for example, are flawed, then the resulting data are of limited value. Additionally, because surveys typically involve only a small sample relative to the entire study population, it is important to have a representative sample to allow for generalization of findings to the population as a whole. Qualitative research recognizes that every social setting is unique and that the researcher has an impact on the setting (Erlandson et al. 1993). In place of reliability, validity, and generalizability, qualitative research is evaluated on the criteria of trustworthiness and credibility. Qualitative researchers can enhance the trustworthiness and credibility of their work through such activities as prolonged engagement, peer debriefings, memos, and triangulation. Given the methods of data collection and analysis described above, we feel confident that the findings of this study are credible and trustworthy.

Discussion

In this section we first document that many response organizations at the federal and local (i.e., New Orleans) levels did not use NIMS and ICS during the response to Hurricane Katrina. Next, drawing upon our data, previous disaster research, and organizational theory, we attempt to explain why many organizations did not

use NIMS and ICS. These structural barriers include training, organizational factors, and research issues.

Use of NIMS and ICS

Both at the federal and local levels we found substantial variation in the degree to which NIMS was used by responding organizations. At the federal level, for example, we assessed the extent to which five different emergency support functions (ESFs) used NIMS and ICS at the Joint Field Office (JFO) in Baton Rouge, Louisiana. Our data clearly indicate that different ESFs exhibited a range of low to high use and commitment toward NIMS and ICS. In two cases, ESFs did not use NIMS and ICS. In one of these two cases, although its staff was in full compliance with NIMS and ICS training, the leadership decided to implement the same response management system it had used for decades. With the second case, a number of people did not know about or show interest in using NIMS and ICS. Again, many disaster veterans used their own systems, often drawing upon informal networks and contacts. Later, they reported receiving pressure from the DHS to use NIMS and ICS. As a result, members of this ESF began using ICS terminology to give the impression of using NIMS and ICS.

Two other ESFs generally followed the NIMS and ICS format. They each had an incident commander and leaders of the four other ICS functions, and generally followed the ICS chain of command. With our final ESF case, members exhibited the maximum use of NIMS and ICS. In their space at the JFO, for example, they were the only ESF to hang signs above their specific ICS functions (i.e., finance, planning, operations, logistics). Additionally, within each ICS function, this particular ESF added more layers to the ICS structure. In short, among the five different ESFs we gathered data on, we found a wide range of NIMS and ICS compliance, from very low to very high.

Our initial data gathering in New Orleans strongly suggests that in many cases, especially out in the field, emergency responders did not use NIMS and ICS. The only general exception seemed to be among officers within the New Orleans Fire Department. When asked, they generally commented that NIMS and ICS worked well for the response, providing a necessary structure during turbulent times. At times, however, even those officers who had positive impressions of ICS would describe instances in which they had to work outside the system in order to get things done. For example, one officer described his own "freelancing" activities, which involved using his personal boat to rescue victims stranded in flooded houses. According to this respondent, higher ups in the chain of command were slow to decide if firefighters should use their personal water craft to perform rescue missions, so he and others decided to go forward on their own.

Our interviews show that firefighters lower in rank directly involved with the response had a far less favorable view of ICS than the officers. Generally, they believed that the magnitude of the situation was beyond what ICS could handle. One respondent, for example, noted that ICS may work well for medium-sized events like a high-rise fire, but not for large and catastrophic incidents like Hurricane Katrina. In fact, among firefighters responding in the field, they noted that their initial use of ICS was haphazard at best. Not until the arrival of other fire departments with ICS training (e.g., New York, Forest Service) did they begin to use the ICS structure in a formal and systematic way. Some of our fire respondents noted that perhaps the size of the event made the initial use of ICS and NIMS quite difficult, if not impossible, to use.

The other key response organization, the police department, did not use ICS. From interviews and other documents related to the response, it appears that generally those in the department were not well trained or aware of ICS or NIMS. Like some other respondents, when asked about using ICS or NIMS, their most common response was a laugh and a shake of the head. Furthermore, police out in the field appeared much more concerned about three essential factors: attempting to maintain some form of social order; trying to survive since waters had flooded many precincts containing essential supplies (weapons, ammunition, cars, food); and, once some degree of social order and personal survival existed (e.g., food, sleep), successfully rescuing people. According to a respondent from the New Orleans Fire Department, other city departments had "no clue" how ICS works, so its relative lack of implementation in the hurricane response is not surprising.

The city Emergency Operating Center reflected a combination of NIMS, ICS, and the National Response Plan (NRP). For example, drawing upon NIMS and ICS the incident commander post represented the location of the mayor and his top representatives. Other functions located close to that post reflected the traditional ICS functions of logistics and planning. Yet, in this same area next to the incident commander we observed other functions resembling the NRP, including disaster planning, public safety, and food and shelter. In short, the use of NIMS and NRP created an organizational hybrid probably not intended by the federal government. Yet, the City of New Orleans appeared to be following both NRP and NIMS requirements.

Other documents corroborate our data and observations regarding the problems of using NIMS and ICS. A web-based document from the California Department of Forestry and Fire Protection noted that on Monday, September 19, 2005, "it was apparent that the Incident Command System needed to be used to manage the incident" (CDF Provides Support following Hurricane Disasters 2006, p. 6). An after-action document by the Southern Area Incident Management Team observed that

the largest problem they encountered was the "lack of ICS involvement of other agencies." In fact, this organization's strongest recommendation stressed that in the future, all parties must use NIMS and ICS to minimize command and control problems (After Action Report 2005, 8).

Structural Barriers to the Use of NIMS and ICS

Despite the strong federal requirement to use NIMS and ICS, we found key organizations at the federal and local levels that did not use, partially used, or pretended to use NIMS. Thus, a primary objective of this chapter is to explain *why* a number of organizations at the federal and local level did not use ICS and NIMS. Below, we argue that a number of interrelated structural barriers inhibited their implementation. These factors include training issues, organizational issues, and the failure to incorporate research-based suggestions in the design of a response management system.

Training Issues. The federal government has provided various mechanisms for federal, state, and local governments to meet NIMS training requirements. Different levels of government offer training sessions, including online, independent study courses. Yet, at the time of Hurricane Katrina, we found strong evidence that large voids existed in training. For example, many organizational representatives at both the JFO and the city of New Orleans EOC lacked awareness of NIMS and the necessary training requirements. At the JFO, representatives from two of the five ESFs we focused upon were generally unaware of NIMS training requirements. Representatives with some ESFs had not even heard of NIMS or ICS. In short, these organizations relied upon their own system of doing business and had little awareness of NIMS.

Officials at both the JFO and New Orleans EOC recognized the lack of NIMS knowledge among many of the responding organizations. As a result, both the JFO and city EOC had NIMS training sessions available at both facilities during the first few weeks of the hurricane response. However, at the JFO, our interviews with both training personnel and potential trainees indicated that only a small number of people made use of the training. Further, since a number of organizations were not using NIMS, newly trained people in NIMS may not have had a chance to use their training. Although we certainly understand the utility and perhaps symbolism of making NIMS training available during the response, overall we believe that this kind of "on the job training" did little to improve the use of NIMS during the response to Hurricane Katrina.

In addition, we found responders within the City of New Orleans expressing various biases against training in general. One firefighter noted that "experiences are

more critical and more important than training." Another noted, "during training everything works fine," and then wondered, "how do you plan and train for something like this?" These attitudes reflect in part observations the senior author has made during general training sessions and even exercises among emergency responders. Simply, in many cases training of any type may not be taken seriously. In summary, we found evidence that many disaster participants at the federal and local level were not aware of NIMS and ICS and the required NIMS training.

Applied Research Issues. NIMS and ICS represent an organizational management system to deal with unpredictable events in a turbulent organizational environment. As Wenger, Quarantelli, and Dynes (1990) point out, ICS ignores a number of key issues about organizations and organizational theory. Below, we show that by ignoring such factors as normativeness, organizational culture, the informal component of organizations, and the rigid or bureaucratic nature of NIMS with the NRP, NIMS and ICS proponents created further barriers to its use.

Generally, normativeness refers to taking skills or management techniques from day-to-day operations and transferring them to disaster operations (Sorensen, Mileti, and Copenhaver 1985). In this specific case, normativeness refers to organizations that use some form of ICS during both daily operations and during disaster situations. Such units as fire departments who use ICS daily should respond more effectively than organizations that do not use ICS during day-to-day operations (e.g., see Brunacini 2002). Generally speaking, the only organizations at the federal, state, or local levels that use ICS on a daily basis are fire departments. Thus, most of the other local, state, and federal organizations that do not use ICS on a daily basis may have problems or may not desire to transition from one type of management structure to another. This was certainly the case with one emergency support function. Although its members generally had full ICS training and had participated in NIMS exercises, they chose to do disaster management in the same style they had for decades. In another ESF case, the involved organizations had developed their own way of coordinating and managing their disaster tasks over years of experience. They also perceived their own mechanisms to be more efficient than NIMS.

In short, normativeness inhibited the use of ICS during Hurricane Katrina. Organizations that use some form of ICS on a day-to-day basis (e.g., fire departments, medical related organizations) did appear to use ICS and NIMS during the response to the hurricane. On the other hand, most of the other organizations at both the federal and local level that did not use ICS on a daily basis generally did not use ICS or NIMS during the hurricane response. Since most organizations do not use ICS on a daily basis, one can see the monumental

problem of having these organizations adopt, train, and use NIMS and ICS during a disaster response.

Organizational culture can be defined as a "social force that controls patterns of organizational behavior by shaping members' cognitions and perceptions of meanings and realities, providing affective energy for mobilization, and identifying who belongs and who does not" (Ott 1989, 69). Even within the federal government, organizations will develop different organizational cultures. For example, certainly the background, history, development, and norms of the Department of Defense, Department of Justice, Department of Homeland Security (and, embedded within it, FEMA) all differ. In addition, a number of volunteer or faith-based organizations along with members of the private sector play key roles in disaster response. Of particular note among these sectors is the American Red Cross, which coordinates the ESF #6 (Mass Shelter and Feeding). The Red Cross and other volunteer organizations have their own sets of rules and ways of doing business that differ from the federal bureaucracy.

An assumption behind NIMS is that "one size fits all." Put another way, NIMS and ICS attempt to standardize such characteristics as organizational structure, communication, and even language. Although such assumptions may work within one type of organizational setting (e.g., fire departments), we must recognize that various organizations do have different histories, folkways, mores, language, symbols, management styles, and structures. NIMS and ICS generally reflect a paramilitary "command and control" approach to disaster management based within fire services. For some, NIMS and ICS may match their organizational culture. Since ICS emerged from paramilitary organizations, those organizations with a (para)military background or strong command and control structures (e.g., Department of Defense, Department of Health and Human Services) may adapt more readily than other types of organizations.

Yet, we also found a federal organization heading up another ESF function that took a different route. Although this organization has a military aspect to it and probably could have integrated ICS rather easily into their operations, they chose not to. Rather, through the last few decades they have developed their own organizational format for both day-to-day and disaster operations. They are comfortable with doing business this way and some feel that their approach is more effective than the new NIMS system. As a result, they decided to use their own management approach for the Katrina response. Yet, they played the NIMS game, showing us that almost all of their representatives had the three key ICS training courses, and that most of those in the ESF had participated in an exercise using ICS and NIMS.

Respondents from another ESF comprised primarily of volunteers representing at least 25 organizations did not seem to give NIMS and ICS much credence. Many of those under this umbrella have years of experience working together, either individually or organizationally. Others who were new to this ESF developed their own way of doing activities. As a result, some organizations experienced a form of "culture clash," trying to adopt or integrate their previous way of doing business during disaster with NIMS. We found other ESF representatives much more concerned about getting the job done than following a bureaucratic structure.

In New Orleans, a police officer involved with the response efforts made a similar set of observations. This person said that the New Orleans police have their own language and way of doing business and that the federal government has their own way. Within the police department, an officer would say what was needed and explain why it was needed, but it was this person's perception that the federal government, especially the military, did not work in this fashion. Thus, if requests were not made per the federal methods, then they would not be filled. One could argue that the use of ICS would have solved this problem. However, our point here is that forcing organizations to use ICS and NIMS is problematic because it ignores the great diversity among organizational cultures.

A related issue worth mentioning, based partially on data gathered from this study and partially on more general interactions with and knowledge of law enforcement officials and firefighters, is that police and fire departments have different ways of doing business. By the very nature of their different jobs, fire departments work more as a team, while police officers often work as individuals. Furthermore, a long historical tension exists between fire and police departments. Thus, people in law enforcement may be less inclined to buy into an organizational format invented and advocated by members of the fire community. More generally, since the federal government forced NIMS and ICS upon all organizations, other organizations had no opportunity for a "buy in" or to provide input on how NIMS or ICS could be adapted for their own use. In summary, the use of NIMS and ICS ignores that organizations have different cultures and assumes that NIMS and ICS can be adapted within any organizational setting.

NIMS and ICS reflect Max Weber's general notion of a rational bureaucracy, with a clearly delineated hierarchy of authority, division of labor, and specialization of tasks. It assumes that any trained person can be put into a position and operations will continue smoothly. However, since the late 1940s, organizational studies have recognized important informal dimensions of organizations (Hall 1996). We believe that NIMS and ICS focus strictly on the rational dimensions of organizational management, while ignoring the important informal aspects or organizations.

A number of our respondents, even those using NIMS and ICS for their response, recognized the importance of the informal organizational structure to accomplish their tasks. Various ESF officials at the JFO recounted how they circumvented the ICS structure to quicken communication and decision making. Rather than following the formal structure, ESF representatives would walk personally to a key ESF counterpoint to relay information or discuss possible decisions. In fact, one experienced relief worker explained this is how effective communication and business among organizations has occurred before. She added that she saw no reason to change this effective means of communication now.

In New Orleans, members of the fire department in the field relied upon their own connections to get things done. For example, as mentioned above the fire department was tasked to rescue victims from rooftops. Yet, the department had no boats, fuel, or dive teams available. They drew upon informal friendships and familial networks to mobilize key resources, including personal boats and an improvised fuel pumping system. If they had not relied upon these resources, their activities may have focused more on search and recovery than search and rescue. Informal networks and communications became key for New Orleans police officers in the field since their formal response system broke down. They drew upon resources and assistance from friends and colleagues from the Baton Rouge police department. Both NIMS and the New Orleans disaster plan did not cover this type of arrangement. Yet, without this help, the situation in New Orleans, especially at the Superdome and Convention Center, would have been worse. Thus, relying strictly upon the formal structure of NIMS and ICS would have slowed down communications and disaster response. A strict interpretation of NIMS would have prevented the use of these informal relations and improvised activities.

During the late 1980s, the federal government initiated an effort to create a plan to coordinate federal response, especially during a large disaster or catastrophic event. It became known as the Federal Response Plan (FRP) and became the forerunner to what is now known as the National Response Plan (NRP). The federal government first used the FRP during the response to Hurricane Andrew. Although the FRP certainly had its problems (Neal 1995), similar to ICS and NIMS it provided a framework for disaster managers to work from. The functional design of the ESFs became the standard for state and local disaster planning through State and Local Government Planning Guide 101. As part of the many changes in FEMA during the current Bush administration, they modified and updated the FRP and called it the National Response Plan (NRP). The NRP maintained the central component of the old FRP, the ESF format. Yet, the combination of the NRP and NIMS created a massive and perhaps even confusing set of instructions, recommendations, possible contradictions, and requirements.

As noted earlier, at the JFO in Baton Rouge we saw a wide range of management systems. At one extreme, one ESF had signs showing the location of its incident commander, finance, logistics, operations, and planning sections. Within each one of the four ICS functions, they also had all of the ICS components (i.e., incident commander, finance, logistics, operations, and planning). The New Orleans EOC attempted to blend NIMS and the NRP. Part of the EOC reflected some of the key components of NIMS and ICS (e.g., incident commander, finance). Other parts of the EOC had some aspects of the NRP (e.g., Public Health). Thus, two different components of the disaster response (i.e., federal and city government) combined the NRP and NIMS in different fashions. We do not contend that these approaches were incorrect, but these examples highlight the confusion and potentially thick layer of bureaucracy the NRP and NIMS concepts created. In fact, we are not the only ones to recognize the bureaucratic morass resulting from attempting to use or integrate the NRP and NIMS. DHS's report to the president notes that the NRP is "far too bureaucratic to support the response to a catastrophe" (Federal Response to Hurricane Katrina 2006, p. 52). Furthermore, the report states that the ESFs, "do not easily integrate in to the NIMS Incident Command Structure," resulting in "competing systems" in the field (53, 72).

The analyses above highlight perhaps a deeper problem with NIMS, ICS, and broader disaster policy in the United States—namely, that disaster policy makers often ignore five decades of disaster research conducted by social scientists. For example, following the design and attempted use of the FRP during Hurricane Andrew, Neal (1993) commented that among other problems, the FRP was not research based. Rather, he argued that the developers of the FRP constructed a logical bureaucratic structure in which specific pieces fit together. The FRP's cousin, the NRP, also appears devoid of empirical research findings. As we have already noted at the beginning of this chapter, ICS and NIMS generally lack any grounding in current general organizational theory or specific empirical knowledge of effective organizational response during disasters. Nor does any effort seem underway to assess objectively and scientifically NIMS and ICS to make the necessary changes to improve the current system or perhaps even develop a different system. Below we highlight some research-based components that appear to be lacking in NIMS.

First and foremost, a long line of research clearly demonstrates that effective disaster response organizations must be flexible, emergent (e.g., Dynes 1994; Neal and Phillips 1995), and allow for improvisation (Webb 2004; Kendra and Wachtendorf 2003; Mendonça and Wallace 2004). Yet, in our view, the NRP (which works along with NIMS/ICS) discourages flexibility, emergence, and improvisation. Similarly, although ICS proponents declare that flexibility is a key component at least on paper, it also assumes that too much flexibility and improvisation is inappropri-

ate. One key textbook on the Incident Management System (IMS), for example, strongly admonishes firefighters who "freelance" (Brunacini 2002, 25–27). During our interviews various responders ironically mentioned the need to be flexible and improvise, yet condemned those who freelance. Freelancing may be fatal to those involved in a structure fire, but as we found through our interviews, freelancing during a catastrophe may save the lives or lessen the suffering of many victims. We must add that one highly respected disaster researcher does suggest that ICS may provide some degree of organizational flexibility (Perry 2003), but he presents no empirical evidence of flexibility within the system.

We found that NIMS at the JFO did not have the flexibility to allow two different types of organizations to be integrated effectively into the ICS format. For example, both members of various volunteer organizations and those organizational representatives working with voluntary organizations told us that they had trouble determining where to place volunteer organizations in the ICS structure. Also, representatives from ESFs, regardless of the degree they were using ICS, noted that the ICS structure did not provide an easy "plug in" for information technology (IT) at the JFO.

One of our respondents offered an insightful analogy, suggesting that we have built an airplane (i.e., NIMS and ICS) on very little science, and now that we have it airborne for the first time we are trying to redesign it so it can stay in the air. We strongly concur with this point. The Department of Defense certainly does not design airplanes in this fashion, yet we have done so when designing the nation's disaster management systems. At the moment we hear many explanations as to why the federal, state, and local governments responded poorly to the hurricane. We would argue that, in part, failure to ground NIMS, ICS, and the NRP in empirical research is one key factor. Annually over the last 50 years, a number of federal agencies (e.g., the National Science Foundation, Department of Homeland Security, FEMA, and the Department of Defense) have spent millions of dollars on social science research related to disaster management, yet many policy makers and disaster response agencies have largely ignored its findings.

Conclusions

Despite a general lack of scientific evidence, many perceive NIMS and ICS as effective management tools for disaster management during the immediate post-impact period. As a result, the federal government has declared NIMS as the central management philosophy for disaster response. Yet, during its first major test, we found that the actual use of NIMS varied substantially. Some organizations were fully committed to using it, while other organizational representatives had never

heard of it. We contend that this wide range of NIMS' usage was due to a number of structural barriers inhibiting its use.

First, we found that a number of participants in the response lacked NIMS training. Reasons for the lack of training ranged from never having heard of NIMS or ICS to having biases against training. Ironically, one organization that was fully compliant in NIMS training elected not to use the NIMS system during the response. Officials made onsite NIMS training available at both the JFO and New Orleans EOC, but many did not have time or elected not to receive the training.

Second, a wide range of organizational barriers inhibited the use of NIMS and ICS. Proponents of NIMS must find a way to integrate it into a wide array of organizational cultures that exist within the different levels of government, volunteer organizations, and the private sector. Contrary to what ICS promotes, one size does not fit all. Further, NIMS fails to significantly draw upon organizational theory and disaster research. For example, the operational philosophy behind NIMS ignores that organizations have informal as well as formal mechanisms of working. Unlike the original FRP where all 22 participating organizations signed off on the document after much negotiation, it appears that NIMS (and ICS) was essentially forced upon the ESF organizations. Further research is needed in this area to track the actual NIMS adoption process.

Finally, both NIMS and ICS largely ignore the vast amount of organizational effectiveness and disaster research that has accumulated over the last 50 years. Rather than having an objective and empirically grounded approach to disaster response, NIMS and ICS are grounded upon the experiences and perceptions of firefighters managing forest fires and structure fires from almost 35 years ago. While these perspectives are certainly valuable, creating a system for fighting fires may not be applicable at all times for managing other types of events, including large-scale catastrophes.

While we have identified several barriers to the use of NIMS and ICS in response to Hurricane Katrina, it is not our intention to suggest that if these barriers were overcome, NIMS would be successful. It is also not our contention that the catastrophic magnitude of Hurricane Katrina meant that any management system would have failed. Instead, this preliminary look at NIMS and ICS during Hurricane Katrina has revealed serious flaws in a system that may be set for future failures.

The federal government is strongly invested in NIMS and ICS, and it is probably too late at this time to suggest a complete overhaul of the way the federal government prepares, plans for, and responds to disaster. However, at the very least, we can draw upon lessons learned from Hurricane Katrina to make NIMS and ICS more user friendly and ultimately more effective. We need to create a less

bureaucratic, more flexible system with a complete buy-in from all the agencies and organizations involved. We need to redesign NIMS and ICS with an eye toward the extensive scientific literature that highlights what factors succeed and fail during disaster and catastrophe response. If we do not attempt to undertake these changes, when the next big disaster strikes, we will have the same enormous disaster response problems.

No management system is perfect. However, we firmly believe that it is time that we draw more explicitly upon existing organizational and disaster research to create a more effective management system for use during disaster—that is, one that is used by all organizations. Aeronautical engineers, going back to the Wright Brothers, have drawn heavily upon existing research to design, build, and operate airplanes. Like these engineers, those involved in creating new disaster management systems should also begin to draw upon over 50 years of research to design and test more effective disaster management systems.

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Hurricane Katrina Debris Removal Operations: The Role of Communication and Computing Technologies

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Abstract

The nature and quantity of debris following a large-scale disaster can create considerable challenges to cleanup efforts and thus to societal recovery. Communication and computing technology (CCT) is now widely deployed to support cleanup operations. Yet despite ongoing improvements in CCT, disasters continue to present debris removal personnel with unique problems, at times requiring them to take on new or expanded roles and to develop new plans under tight time pressure. The theory of task-technology fit specifies how CCT may be matched to a variety of tasks. The main objective of this study is to test the adequacy of this theory when debris removal plans cannot be applied or when debris removal personnel deviate from their prescribed roles. The study, which is ongoing, includes collection of data on debris removal operations in southern Mississippi. The methodology of this study is presented, along with preliminary results. Future work, including possible implications of this work for theory and practice, are discussed.

Keywords: disaster recovery, debris removal, information technology, task-technology fit

The nature and quantity of debris following a large-scale disaster can create considerable challenges to cleanup efforts and thus to societal recovery. Risks associated with debris can potentially impact both social and technological systems (e.g., critical infrastructures), and therefore must be managed as part of debris removal operations. When debris-inducing disasters occur in a built environment, there may also be challenges related to use of debris removal equipment and personnel. Communications and computing technology is now widely deployed to support response personnel during cleanup operations in addressing these and other challenges. For example, during the cleanup at Ground Zero, a wide range of such technologies were used by individuals and by groups, including cell phones for communicating between field and office personnel; geographic positioning systems for tracking the location of debris removal equipment; computer-aided design tools for creating engineering drawings; and content management systems for tracking many types of documents (Langewiesche 2002; Tamaro 2002; Mendonça, Peraza, and Stefan 2005). There has been a steady trend in recent years toward tighter integration of these technologies. As a result, the channel capacity of communications and computing technology is increasing, allowing more data to be sent with greater ease (e.g., cell phones with the capability to transmit, receive, and store digital files).

Yet despite these technological improvements, disasters continue to present responding organizations with unique problems. As reported in many years of research on disaster etiology and response, disasters often require responding organizations and individuals to take on new or expanded roles, and may also require them to develop new plans under tight time pressure in order to meet response goals. To enable effective use of available communications and computing technology in such circumstances, it is advisable to have heuristics that can support response personnel in deciding which technologies are most appropriate for supporting different types of response activities.

This chapter describes the design and preliminary results of a study on the use of communications and computing technology (CCT) in support of debris removal operations following Hurricane Katrina. The study, which is ongoing, includes collection of data on debris removal operations in southern Mississippi. The theoretical framework for the research is provided by the theory of task-technology fit, which specifies appropriate technologies for use in accomplishing different types of tasks. This work seeks to assess the adequacy of this theory when plans either do not apply or cannot be applied, and/or when debris removal personnel deviate from their prescribed roles. The research problem and needs are presented first, followed by research design, analytic method, results to date, and discussion and conclusions.

Research Problem and Needs

The analytic approach of the case study is intended to test the theory of task-technology fit in the domain of debris removal operations and to generate guidelines for the use of communication and computing technology in planning for, responding to, and learning such operations. This section outlines the research problem by reviewing related work and generating a set of questions to be evaluated using data from the field.

According to Campbell (1988), a task is defined as the behavior requirements for accomplishing stated goals, via some process, using given information. Zigurs and Buckland (1998) propose five categories of tasks: *simple* tasks, which have a single outcome and decision scheme; *problem solving* tasks, in which there is "a multiplicity of paths to a well-specified, desired outcome"; *decision* tasks, in which "choosing or discovering an outcome that optimally achieves multiple desired end states" is emphasized; *judgment* tasks, in which task-associated information is "conflicting and probabilistic in nature"; and *fuzzy* tasks, which include "both multiple desired end-states and multiple ways of attaining each of the desired outcomes."

To support task performance, communication and computing technology (CCT) may be used. A particular CCT may be classified according to the combination of process structuring, communication, and information processing support it provides (Zigurs and Buckland 1998). For example, current cell phones provide not only communications support, but also information processing support since they are capable of integrating text and graphics. This study uses a support dimension to refer to whether CCT supports task performance or not. If so, a CCT may be classified using the Zigurs and Buckland (1998) framework.

Prescriptive guidance on linking task to technology is given by Zigurs and Buckland (1998), who provide five propositions that specify which combinations of technologies are likely to produce better performance compared to other technologies, as shown in Table 1.

TABLE 1: Hypothesized Best Fit Technologies

Proposition	Task	Technologies for Best Performance
P1	Simple	Communication support
P2	Problem	Information processing
P3	Decision	Information processing and process structuring
P4	Judgment	Communication support and information processing
P5	Fuzzy	Communication support, information processing, some process structuring

Past work on emergency response decision making suggests that two other factors, here denoted *role* and *plan*, may impact task performance. The main research problem for this work is to test the five propositions in Table 1 under different values of the role and plan factors. The role factor indicates whether or not behavioral requirements of the task are consistent with expectations for the role of the individual or group. Kreps and his colleagues (Bosworth and Kreps 1986; Kreps and Bosworth 1993) have investigated the taking on by an individual of behavioral requirements that differ from those expected by the person's role. Subsequent work by Webb et al. (1998) and Webb (2004) has involved decomposition of role into behavioral components. The key point is that, in disasters, individuals and groups may improvise their roles by executing behavioral components that have not been planned-for or trained for (Mendonça and Wallace 2004). Groups that are improvising their roles may therefore be expected to accomplish tasks in novel ways, leading to unexpected demands on CCT support (Mendonça forthcoming). This work tests for the equivalence of CCT efficacy when roles are stable versus improvised.

The *plan* factor indicates whether an emergency response plan, standard operating procedure, or the like, was used in accomplishing the task. As an example, it is possible for a problem solving task to be planned for or not. During the cleanup of Ground Zero, engineers had to design various mats on which to place the cranes that would be used in debris removal. The intended outcome was clear (a mat of a design that met specifications), and engineers indicated that there were multiple ways to accomplish that. However, this particular task had not been planned for (Hendela and Mendonça 2004). When no standard operating procedure or plan is available or feasible, decision makers will need to improvise a course of action. Yet improvisation presents particular cognitive challenges to decision makers (Mendonça and Fiedrich forthcoming; Mendonça and Wallace forthcoming), and thus to the potential efficacy of CCT. This work tests for the equivalence of CCT efficacy when tasks are executed in relation to a plan or not.

The main dependent variable for this study is CCT efficacy, which is measured using a variety of variables, some of which are taken from the Ground Zero study, others of which are developed for this study. This approach is necessary since many tasks are likely to have multiple and context-specific measures of performance; it is also desirable, since this study provides its main value mainly through its identification of propositions that should be tested further. A rich set of dependent variables is intended to increase the likelihood that salient propositions will emerge, which may be further investigated in subsequent research.

Research Design

Data Collection

The unit of analysis for this study is the *task* as performed by the individual or group. To identify tasks, the research team consults with response personnel in order to identify *cases* that are salient, verifiable, and rich: salient, in that they are or were highly relevant to the cleanup work; verifiable, in that it is possible to triangulate observations on the case between multiple observers or multiple data sets (Weick and Roberts 1993; Roberts, Stout, and Halpern 1994); rich, in that a wealth of data is available for use in describing them. This is desirable since, given the scope of this study, detailed descriptions are more likely to generate insights as well as ideas for future research (Yin 1993, 1994). Each case entails a number of tasks. For example, the case of crane placement at Ground Zero discussed earlier comprised four tasks (where to place the crane, how to design the mat, how to transport the crane to the mat, and how to place the crane on the mat). Development of a case requires processing of various data sources, including interviews, maps, plans, meeting minutes, and engineering drawings. To provide additional detail on how personnel accomplished the tasks, the critical decision method (Klein, Calerwood, and MacGregor 1989; Hoffman, Crandall, and Shadbolt 1998) is used whenever possible. This method uses a number of probes, of increasingly greater depth, to uncover information on the context and substance of task performance. The cases are converted into a narrative form, from which tasks are identified using the method given by Zigurs et al. (1999).

Classification

Each task is first classified by *type*, using the results of a survey completed by a respondent. Task-technology fit theory is then be used to determine the prescribed CCT, against which the field data are compared (Zigur and Buckland 1998; Zigurs et al. 1999). This stage of the work therefore provides the normative results tested in the remainder of the study.

Each task is classified along the *role*, *plan*, and *support* dimensions discussed previously. For the role dimension, instruments from work by Kreps and colleagues are adapted for use in coding the interview data. For the plan dimension, questionnaire instruments from Moorman and Miner (1998) are used to collect data from response personnel. These instruments, which have been incorporated into many studies, use seven-point Likert scales (filled in by respondents) to measure the degree of agreement with some statement (e.g., "my organization has a standard operating procedure for this situation"). For the support dimension, descriptions of the main technologies used in the tasks are developed. Independent coders are then given these descriptions and asked to classify the technologies along the

dimensions given by Zigurs and Buckland using an instrument developed by following available guidelines (Zigurs et al. 1999). Supplemental evidence is sometimes provided by documents such as activity reports, meeting minutes, maps, and response plans.

The study design matrix is an augmented version of Table 1 above, which shows the prescribed levels of support from various types of CCT for the various tasks. There are four combinations of the role and plan factors. Data are therefore being collected so that at least four observations are available for each task-technology combination. Table 2 summarizes the hypotheses from Table 1 by showing the prescribed levels of support from various technologies for the various tasks.

TABLE 2: Fit Profiles of Task Categories and Technology Dimensions

	Task				
Technology	Simple	Problem	Decision	Judgment	Fuzzy
Process structuring	Low	Low	High	Low	Medium
Communication support	High	Low	Low	High	High
Information processing	Low	High	High	High	High

Analytic Method

To provide context for the study, response activities are first examined at a fairly broad level. This leads to the identification of cases, in a method akin to snowball sampling. Each of the cases is described in the form of a narrative along with supplemental information such as accompanying charts, tables, and figures, with tasks and technologies identified and classified as discussed previously. As a result, it is then possible to determine the extent of fit between a task and the technologies used in accomplishing it, thus providing an initial assessment of the adequacy of the theory.

To assess the theory more deeply, the survey responses are examined in order to determine whether differences in role alignment or plan applicability affect task-technology fit. This amounts to testing three null hypotheses of "no difference" for each cell in Table 2 (one for role, one for plan, and one for any interaction). In total, then, here are 45 null hypotheses to be tested.

The following example illustrates the method for testing the hypotheses in Table 2. Assume that data from four successful decision-type tasks are available, all of which used communication support technologies (corresponding to the shaded cell in Table 2). The prescriptive level of support is low. Table 3 illustrates the type

TABLE 3: Illustrative Example

		Task: Decision	
		Plan	*No Plan*
Technology: Communication Support	*Role Following*	Low	**High**
	Role Improvising	**High**	Low

of revision to the theory that would result from the analysis. The upper left and lower right cells show low use of the technology, in line with the theory. The remaining cells represent tasks where communication support technology had high use. Deeper analysis of task performance in the context of the case is intended to provide further explanations for deviations from the theory.

The next section provides an overview of debris removal activities, briefly summarizes a number of cases, and investigates two of the research hypotheses using data from tasks associated with two cases.

Results to Date

By recent estimates, Hurricane Katrina generated a total of 118 million cubic yards (118m yd^3) of debris, more than twice the amount generated by the four Florida hurricanes of 2004 and six times the amount created by Hurricane Andrew. The initial estimate of the total amount of debris in Mississippi—the state that is the focus of this study—was 40 million cubic yards (40m yd^3). Coastal regions accounted for an estimated 30m yd^3; other regions for the remaining 10m yd^3. Debris may be classified as vegetative or nonvegetative. Vegetative debris includes downed trees, limbs, leaves, stumps, and other natural vegetation. Nonvegetative debris consists of construction and demolition debris, white goods, hazardous materials, household hazardous waste, vehicles, boats, floating debris, and sunken vessels, though not all these types of debris were included in the initial estimates. Approximately 65 percent of the coastal debris was estimated to be nonvegetative, while the corresponding percentage for noncoastal areas was 15 percent. As a result, total cubic yardage of debris was estimated to be approximately evenly split between vegetative and nonvegetative debris at the onset of the mission.

As of October 22, 2005, approximately 200 temporary disposal sites were being used, and approximately 2,000 people were involved directly in debris pickup, resulting in an average of 300,000 yd^3 picked up per day. As of March 14, 2006, the total estimated amount of debris was 46 million yd^3, of which 35 million yd^3 had been removed. The remaining debris was comprised of 10 million yd^3 of land debris and one million yd^3 of waterway debris. Also as of this date, debris removal

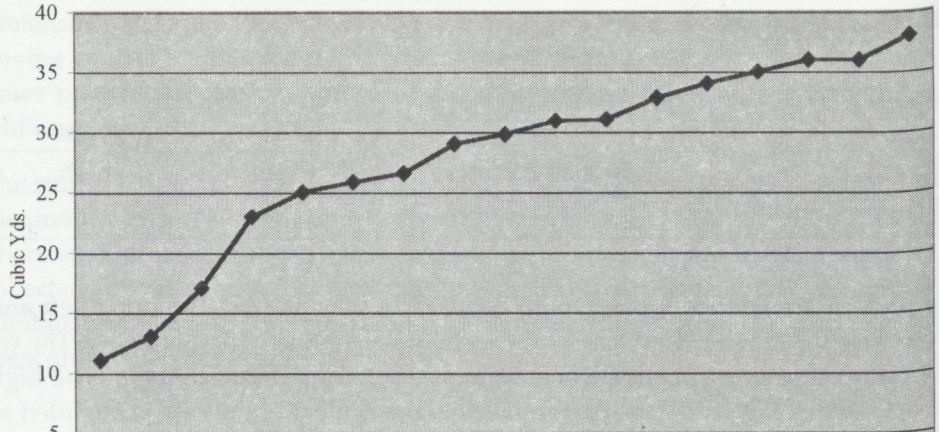


FIGURE 1: Cumulative Debris Removed

operations had been completed in 66 of Mississippi's 82 counties. Figure 1 shows the cumulative amount of debris removed beginning in mid-October 2005 and continuing through late March 2006, based on Federal Emergency Management Agency (FEMA) reports.

Organizational Structure and Scope of Work

FEMA is the lead agency for debris removal activities, so that the U.S. Army Corps of Engineers's (USACE) work takes place in the broader context of FEMA activities. The National Response Plan specifies fifteen emergency support functions (ESFs). USACE's debris removal operations fall under ESF-3 (public works and engineering). The Corps has four to five pre-positioned debris teams stationed at various locations in the country, and these are available to support the very early stages of an anticipated or actual mission. As part of its predisaster mission, USACE Planning and Response Teams (PRTs) provide technical assistance to FEMA for tasks such as estimating the likely nature and scope of debris removal activities. After the disaster occurs, one or more PRTs may move to the impacted area. In addition to USACE, other agencies share some debris removal operations (these include FEMA, local governments, the U.S. Department of Agriculture/Natural Resource Conservation Services/Farm Service Agency, the Federal Highway Administration (FHWA, Mississippi Department of Transportation, Mississippi Department of Marine Resources, the U.S. Environmental Protection Agency, the U.S. Department of the Interior/National Park Service, and the U.S. Coast Guard).

USACE provides three possible levels of assistance. The minimum level is technical assistance. The next level is assistance to cities and counties in managing contracts with debris removal contractors. The next level is a full mission, in which the Corps contractually arranges for contractors to perform the debris mission. As part of this mission, the Corps interfaces with customers (i.e., cities and counties). Quality control is provided by contractors, with the Corps providing quality assurance on the execution of these contracts.

Within USACE, the Debris Specialist is assigned to a region and operates out of the region's Joint Field Office. The Debris Specialist is responsible for managing the Project Officers and Public Assistance Coordinators, and reports to the Debris Coordinator and Debris Group Supervisor. The Debris Coordinator is the USACE liaison to state and local governments; the Debris Group Supervisor is the liaison to the U.S. Congress. Exchange of information between state and federal government is handled by the Debris Task Force (DTF). The DTF also serves as an issues forum and a means for problem solving on debris removal issues. The DTF is staffed with representatives from eight federal and five state government organizations.

As mentioned previously, a number of other agencies share some debris removal responsibilities with USACE. The activities of these agencies are in line with the geographic placement of the debris, and at times with the nature of the debris. For example, FHWA is responsible for debris removal along federal highways. USACE activities (which include those of the contractors it monitors) usually include debris removal only from public, non-federal rights-of-way. In other words, pickup of debris occurs at curbside. It is rare for USACE to be responsible for removing debris from private property. With Katrina, the Corps also has responsibility for removing boats from land (something previously done by the U.S. Coast Guard).

The three broad stages of debris removal are pickup, reduction, and disposal. Concurrent with activities in these stages are monitoring and reporting. At some point, the mission is closed out. Key measures of performance of debris removal operations are provided by answering three questions:

1. How much debris has been removed (daily and total)?
2. How much has been reduced at the temporary debris storage and reduction sites (TDSRs)?
3. How much debris has finally been disposed?

Daily and weekly reports are filed in order to track progress according to these measures. Which measures are emphasized is likely to change over time. For example, as of October 24, 2005, the strongest emphasis was on the first measure, next most on the second measure, with the least emphasis on the third measure.

Data Collection Methods

An initial visit to the field took place from October 24–26, 2005, in Jackson, Diamondhead, and Hattiesburg, MS. Consistent with the design of the study, data were collected to provide an overview of Corps debris removal tasks, descriptions of specific examples of these tasks, and the role of CCT in executing these tasks. Given the dynamic and evolving nature of the Hurricane Katrina debris removal mission, it was necessary to consult written reports of planned and ongoing activities, and also to explore some of these activities in greater detail through interviews with appropriate field personnel, in order to provide an overview of the mission.

Identification of cases proceeded by talking with coordinating personnel who were asked to discuss particularly challenging or unusual situations. Given the design of the study, a number of cases were identified. While this stage of the work can proceed rapidly, it does require respondents to deviate from their current activities. Indeed, many potential respondents simply did not have the time to talk about their experiences, usually owing to hard deadlines. For example, during the October 2005 visit a number of very important initiatives were underway, including the identification of historic properties and the development of a protocol for removal of debris from private property. Table 4 lists the sites visited during the first field visit:

TABLE 4: Sites Visited

Site	Location
Joint field office	Jackson
Regional field office	Diamondhead
Regional field office	Hattiesburg
TDSR 1	Rutland
TDSR 2	Tatum

The visits to the TDSR sites were conducted in the presence of responsible engineers (REs). Numerous photographs were taken at both sites. Some onsite personnel spoke briefly with the research team.

Debris Removal Activities

This section summarizes pre- and postevent debris removal activities executed by the Corps within the previously defined scope of work. Some of the personnel involved in those cases consented to respond to the short version of the task-tech-

nology fit questionnaire. The starting set of cases identified in the first field visit is summarized in Table 5. Two of these cases are next discussed in detail.

TABLE 5: Cases Identified

ID	Case	Description
1	Pre-event debris estimation	Estimated debris quantity and type for different hurricane categories and trajectories. Includes estimation of staffing and equipment levels and locations and preliminary identification of debris storage sites.
2	Initial postevent debris estimation	Revisions to pre-event estimates of debris quantity, type, and geographic distribution.
3	Initial TDSR site screening	A pre-event activity intended to identify sites that could be used for TDSR.
4	Selection of TDSR sites	Selection of sites where debris will be reduced and temporarily stored.
5	Assessment of historical significance	Southern Mississippi contains numerous structures that are listed as historically significant. The structures are being assessed to determine if they must be demolished or can be repaired.
6	TDSR ticketing process	Determination of debris quantities brought to TDSR sites by contractors.
7	Private property debris removal	Debris removal from private property refers to the activity of removing debris from space within property line boundaries of private residential land. This is a relatively rare activity for the Corps.

Case 1: Pre-event Estimation of Debris Quantities, Type, and Distribution. Estimation of the quantity, nature, and geographic distribution of debris (Case 1) is informed via interaction with mathematical models, along with engineering judgment. The models take as input data about the built and natural environments, the likely behavior of the hurricane (e.g., path, wind speed), and the distribution of the population. The models provide as output estimated debris quantities for different areas, with estimates for the quantities of various types of debris. The means are available for displaying model outputs (graphical and numeric), and for investigating the assumptions of the models. These models were used to provide an initial estimate of debris quantities. The Debris Management Plan provides regional-level guidance on the conduct of debris removal operations. Individual plans are prepared at the county level by contractors.

One of the engineers who had worked on estimating the initial quantity of debris in Mississippi provided the questionnaire results given in Tables 6 through 11. Table 6 shows that the task is a fuzzy task. Table 7 shows that the respondent is well-accustomed to using the main source of computer-based information (plans and process). Table 8 classifies each of the identified technologies using the

TABLE 6: Case 1: Task Attribute

Task Attribute	Multiple Solutions	Multiple Paths to Solution	Presence of Conflicting Goals and/or Objectives	Presence of Uncertainty in Possible Solution
Score	1	1	0	0

Where 1 = yes, 0 = no

TABLE 7: Case 1: Major Sources of Computer-Based Information

	Major Sources of Computer-Based Information					
	(1)	(2)	(3)	(4)	(5)	
Name	COE Model	FEMA Model	Plans and Process	Pass Down Info	KTR	All Other
What percentage of your data use does each of these account for?	20%	20%	40%	10%	10%	
How many years have you personally used this source in this or any other job?	7 years	3 years	20 years	30 years	20 years	
Before doing this task, were you familiar with this source? (Yes/No)	No	No	Yes	Yes	Yes	

Brief description of each source:

1. Corps of Engineering modeling – disaster response
2. FEMA – information and assessment
3. Plan, process, training provided by COE
4. Pass down information from team, experience
5. Work with KTR and contractor process

typology introduced previously. Pass down information and work with contractor requires the support of communication support technologies, and the USACE and FEMA models use technologies which gather, aggregate, evaluate, and structure information, which is an information processing type of technology. Plans and process data are supported by process structuring technologies.

The support provided by the main technology is assessed as satisfactory (a score of 3.2/4 in Table 9). The respondent was closer to role-following than role-improvising (a score of 5.2/7 in Table 10), and believed that the organization's experience was more relevant than not (a score of 5.5/7 in Table 11).

TABLE 8: Case 1: Technology Dimensions

Source of Information	(1)	(2)	(3)	(4)	(5)
Name	COE model	FEMA model	Plans and process	Pass down information	KTR
Type	Information processing	Information processing	Process structuring	Communication support	Communication support

TABLE 9: Case 1: Support

Construct	Accuracy	Right Data, at the Right Level of Detail	Accessing	Under-standing	Combining	Training	**Mean**
Score	3	3	3	4	2	4	**3.2**

Where 4 = very good, 3 = satisfactory, 2 = needs improvement, 1 = poor
Source: COE Model

TABLE 10: Case 1: Role

Construct	Consistency	Similar Tasks, Emergency	Similar Tasks, Nonemergency	Similar Situation, Emergency	Similar Situation, Nonemergency	**Mean**
Score	6	5	4	6	5	**5.2**

Where: 1 = strongly disagree, 4 = neither agree nor disagree, 7 = strongly agree (seven-point Likert scale). High score means Role Following, low score means Role Improvising.

TABLE 11: Case 1: Plan

Construct	Well-Defined Procedures	A Standard Approach	A Great Deal of Knowledge	Strong Skills	**Mean**
Score	5	5	6	6	**5.5**

Where: 1 = strongly disagree, 4 = neither agree nor disagree, 7 = strongly agree (seven-point Likert scale). High score means Planned, low score means Not Planned.

Case 3: Initial Temporary Debris Storage and Reduction Site Screening. Figure 2 illustrates the debris removal process. Debris that is removed from the curbside (or other areas) may be transferred to a TDSR site, where it is sorted and/or reduced. Sites may be pre-identified and permitted for use as TDSRs before the event. Landfills (which are permanent disposal sites) are established by states. Regarding the environmental conditions for landfills, states can be more restrictive but not less so than the U.S. Environmental Protection Agency. There are different classes of landfill sites, according to the types of debris they can accept. Areas of responsibility are identified as zones (e.g., Hancock County except for the top half of Waveland). Zones are further broken down into sections, based on such factors as density of debris and roadways.

If the location of a TDSR has not been established before the event (or if there are insufficient TDSR sites), then USACE works with local governments to identify

public lands that can be used as TDSRs. When this cannot be done, other alternatives (such as renting private land) are explored. Any candidate area is screened to assess its appropriateness as a TDSR site. This entails visiting candidate areas, identification and permitting of sites (including environmental screening),

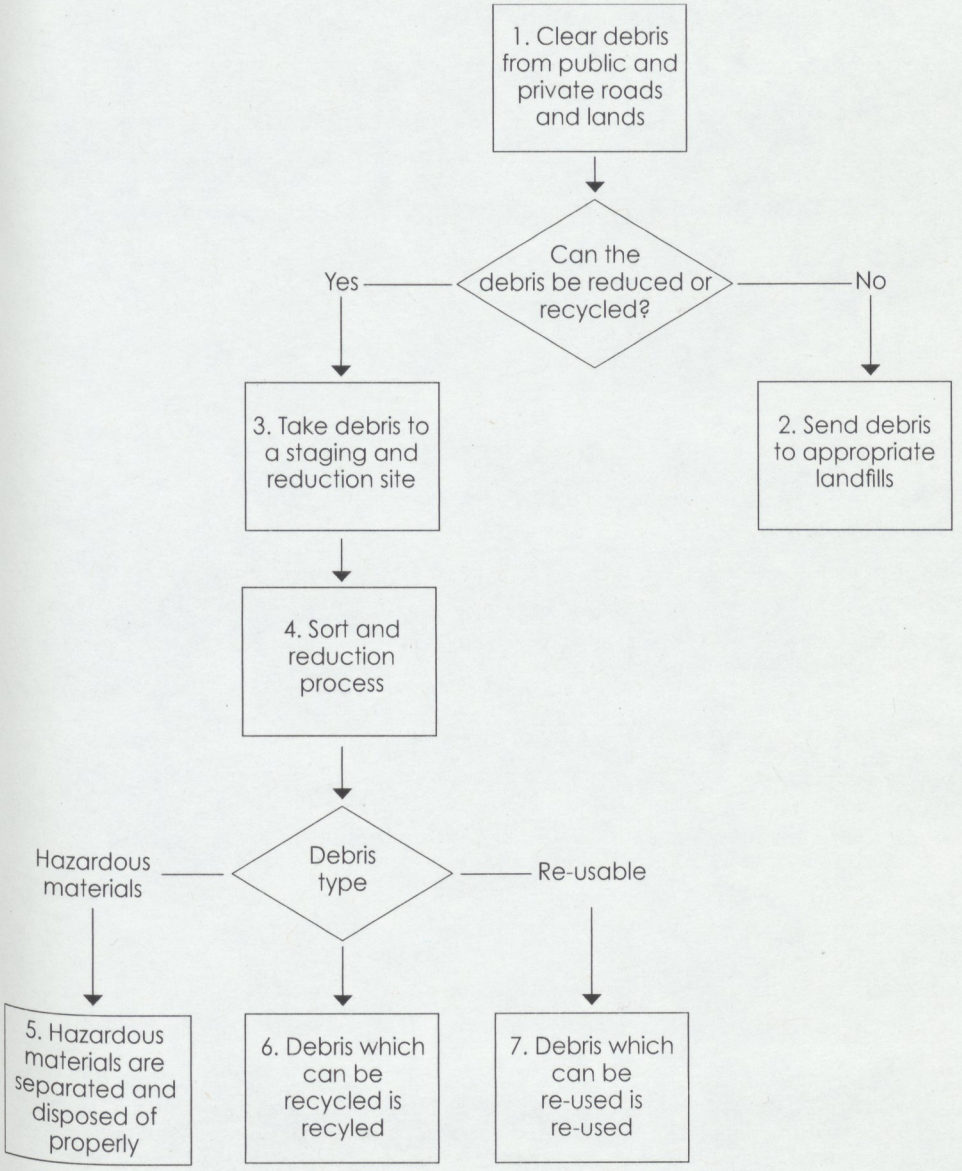


FIGURE 2: Debris Removal Process

TABLE 12: Case 3: Task Attribute

Task Attribute	Multiple Solutions	Multiple Paths to Solution	Presence of Conflicting Goals and/or Objectives	Presence of Uncertainty in Possible Solution
Score	1	1	1	1

Where 1 = yes, 0 = no

TABLE 13: Case 3: Major Sources of Computer-Based Information

Name	(1) Geo-referenced USGS Topography Maps	(2) Aerial Photos	(3) ArcView Generated Layers	(4) Street Maps	(5) Internet-Based Environmental Information	All Other
What percentage of your data use does each of these account for?	20%	20%	15%	10%	20%	15%
How many years have you personally used this source in this or any other job?	8 years	7 years	6 years	7 years	6 years	
Before doing this task, were you familiar with this source? (Yes/No)	Yes	Yes	Yes	Yes	Yes	

Notes: Brief description of each source: 1. US Geological Survey – (USGS) generated 7.5 minute georeferenced topography maps. 2. High altitude aerial photography georeferenced – sometimes infrared, sometimes low altitude. Source: Department of Transportation. 3. Shape files showing site boundaries, Natural Resources Conservation Service soil survey maps, species locations, resource locations, used to determine distance or area. 4. Mapquest, Google maps, Yahoo maps, Microsoft Streets and Roads, and so on. 5. Endangered species lists generated by U.S. Fish and Wildlife Service, species descriptions, geographic and geologic descriptions, climactic descriptions, plant databases, federal/state/local regulations and laws.

TABLE 14: Case 3: Technology Dimensions

Source of Information	(1)	(2)	(3)	(4)	(5)
Name	Geo Referenced USGS Topography Maps	Aerial Photos	ArcView Generated Layers	Street Maps	Internet-Based Environmental Information
Type	Information Processing	Information Processing	Information Processing	Information Processing	Information Processing

providing an initial notice to proceed, initiating contractor operations, and developing an estimated date of completion. Some of the issues involved in setting up the site include clearing of staging land, potential demolition of historic structures, and debris clearance from environmentally sensitive areas. These three issues are managed through the Debris Task Force.

One of the engineers involved in TDSR site selection provided the survey responses summarized in Tables 12 through 17. Table 12 shows that the task is a fuzzy task. The most-used technologies are given in Table 13, then classified in Table 14 as all being information processing technologies. According to Zigurs and Buckland (1998), information processing technology is technology used to gather, aggregate, evaluate, and structure information. The above computer-based data are all provided by this type of technology. Support (Table 15) is rated as satisfactory. Table 16 shows the respondent viewed his role as midway between role improvising and role following, while Table 17 shows that plans were moderately applicable. The degree of support provided by the georeferenced USGS topographic maps was satisfactory (Table 15). (Note that while this source was used the same percentage of time as aerial photos and Internet-based environmental information, the respondent stated that she most wanted to fill out the remainder of the questionnaire with respect to the topography maps.)

TABLE 15: Case 3: Support

Construct	Accuracy	Right Data, at the Right Level of Detail	Accessing	Understanding	Combining	Training	Mean
Score	4	3	2	3	3	3	3

Where 4 = very good, 3 = satisfactory, 2 = needs improvement, 1 = poor.
Source of Information: Georeferenced USGS topography maps.

TABLE 16: Case 3: Role

Construct	Consistency	Similar Tasks, Emergency	Similar Tasks, Nonemergency	Similar Situation, Emergency	Similar Situation, Nonemergency	Mean
Score	6	4	7	1	2	**4**

Where: 1 = strongly disagree, 4 = neither agree nor disagree, 7 = strongly agree (seven-point Likert scale). High score means Role Following, low score means Role Improvising.

TABLE 17: Case 3: Plan

Construct	Well-Defined Procedures	A Standard Approach	A Great Deal of Knowledge	Strong Skills	Mean
Score	2	2	5	6	**3.75**

Where 1 = strongly disagree, 4 = neither agree nor disagree, 7 = strongly agree (seven-point Likert scale). High score means Planned, low score means Not Planned.

Discussion

Both Case 1 (pre-event debris estimation) and Case 3 (initial selection of temporary debris storage and reduction sites) concern fuzzy tasks, which—by the prescriptive theory discussed previously—call for high levels of support from information processing technologies. Indeed, the data suggest that most of the technologies used in the two cases are information processing technologies, with some use of process structuring and communication support technologies in Case 1 (Table 18). For Case 1, role is more improvised than in Case 3. The task associated with Case 1 appears to have been closer to the organization's existing procedures than in Case 3. The value for support in each case suggests a satisfactory degree of support was provided by the main technology (Table 19).

These results should of course be interpreted with some caution, since they are based on the responses of only two individuals. However, they are sufficient to allow some comparison with the prescribed theory. Regarding Case 1, Table 2 shows that process structuring technologies can provide a moderate degree of support for fuzzy tasks. In Case 1, the degree of support evident in the data may be characterized as moderate—in line with the prescription. The respondent was following his role more than improvising it. Similarly, the organization's plans seemed more applicable than not. This result suggests consistency with the theory as expressed in Table 2. Next, regarding Case 3, Table 2 shows that information processing technologies can provide a high degree of support for fuzzy tasks. In Case 3, the degree of support evident in the data may be characterized as moderate. Given the available data, it is difficult to say whether the role or plan dimensions contribute to this outcome, though it certainly seems that the respondent in this case was not adhering entirely to role expectations. It also seems that plans were not entirely applicable. Further results such as these would suggest that role and plan impact fit.

TABLE 18: Fit Profiles for Case 1 (Pre-Event Debris Estimation), and Case 3 (Initial TDSR Site Screening)

Technology	Task: Fuzzy
Process Structuring	Plans and Progress (1)
Communication Support	Pass Down Information (1), KTR (1)
Information Processing	COE Model (1),FEMA Model (1) Georeferenced USGS Topography Maps (3), Aerial Photos (3), ArcView Generated Layers (3), Street Maps (3), Internet-Based Environmental Information (3)

TABLE 19: Summary for Cases

Case	Task Type	Technology Type	Role	Plan	Support
Plans and progress (1)	Fuzzy	Process structuring	5.2	5.5	3.2
Georeferenced USGS Topography Maps (3)	Fuzzy	Information processing	4	3.8	3

Conclusions

This study is investigating the use of computing and communications technology during debris removal operations in Mississippi following Hurricane Katrina. The theoretical framework for this study is provided by task-technology fit theory, which specifies the types of technologies that are best suited to supporting various types of tasks. Surveys of field personnel, supplemented with other information such as interviews and reports, are being used to explore whether this theory is appropriate when personnel improvise roles, or when unplanned-for contingencies arise. Results thus far suggest a broad role for CCT in many phases of the debris removal process, including both pre-event planning and postevent response. Existing and new survey instruments—particularly those not previously used in emergency response—are being used to examine CCT use, and this chapter has illustrated how these instruments function, and has suggested how data collected with them may be analyzed. The results of the two cases discussed here suggest that role improvisation and plan inapplicability may impact task-technology fit, but most importantly show how the assessment of fit may be conducted in this domain. Continued data collection will allow for more rigorous testing of the research hypothesis, and should create opportunities for building theory about the impact of role and plan on fit, as well as for developing new technologies to better support debris removal operations.

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Part 5:

Individual and Collective Experience

There for the Storm: Warning, Response, and Rescue among Nonevacuees

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Abstract

Popular presentations of the response to Katrina have in many ways reproduced misconceptions regarding the human response to disasters that researchers have been attempting to debunk for decades. This work continues to challenge these perceptions through the preliminary analysis of data gathered during fieldwork after Katrina struck the Gulf Coast region. We suggest that while official and media reports tend to focus on the fragility and irrationality of individuals, this limited framing inaccurately presents the reality of social behavioral response to disaster. Conclusions suggest that in many ways the behavioral and decision making patterns of nonevacuees and their resulting escape/rescue from danger were forms of social action undertaken collectively, a finding that resonates strongly with conclusions in both the empirical literature on warning response and search and rescue. Further we suggest that these findings contradict the breakdown portrayals and replace them with alternative value-oriented and socially relevant criteria. The connections between past findings related to these insights, as well as links to social theory, are briefly explored.

Keywords: search and rescue, warning response, decision making, behavioral response, Katrina, media framing

Hurricane Katrina is justifiably regarded as one of the costliest disasters in U.S. history. As a review of statistics related to this event reveals, Katrina had an impact zone of approximately 90,000 square miles across Louisiana, Mississippi, and other states, more than a million displaced victims, over 1,300 deaths, and gave rise to economic costs exceeding $80 billion dollars. Only in comparison to other hurricanes (Cutter et al. 2006) might we begin to appreciate such devastation, which, due to a combination of scope, degree, duration, and social disruption, has been called catastrophic by some scholars (Quarantelli 2005). It is important to recognize however that the devastation wrought by Katrina is more than the sum of fierce winds, powerful storm surges, and flood waters. As Cutter et al. (2006) suggests, what made Katrina one of the largest disasters in U.S. history was not its meteorological characteristics, but *whom* it affected and how we perceived those impacts. This perspective draws on a tradition in social science to view catastrophes as hazards with widespread social impacts of a prolonged duration with a number of socially generated obstacles to recovery. Common features of such disruptions include issues such as the interruption of community functions and response roles, the presence of an aggressive and sustained federal response, and a tendency for issues to be framed primarily by national media rather than locals who have an intimate knowledge of what is happening onsite.

In a trend not uncommon during disasters in general (Fischer 1998), and certainly not to Hurricane Katrina (Rodríguez, Trainor, and Quarantelli 2006; Tierney, Bevc, and Kuligowski 2006; Dynes and Rodríguez 2005), a focus on dramatic events has lead to the perception that individual victims behave in a disorganized, regressive, and antisocial manner. Notwithstanding the exceptions to this observation, depicting individual response in such a manner risks constructing evacuees, responders, and volunteers as irrational, which, in turn, has great potential to result in ineffective policy.

Given such concerns, we have chosen to focus this analysis on the complexities and variations in actions taken by victims of Hurricane Katrina who remained on the Gulf Coast during impact. The general suggestion, we maintain, is that interpretations and claims made by both public officials and the media reveal the use of a very limited interpretive framework, which highlights issues related to social breakdown and as a result labeled evacuees as either "victims of the system" or "irrational." While many may dismiss the importance of these framings, we suggest that this presentation limits how reality is interpreted and as a result also limits our understanding of the complex social processes at play during the evacuation and response to Katrina. As shown in other contexts, how we interpret the world around us has serious and significant effects on social interactions, public policy, types of organizational actions engaged in, and even the levels of assistance particular communities will receive in disasters. While such categories may hold

a degree of truth, such a discourse ultimately obscures a host of sociostructural factors, not the least of which are culture, stratification in terms of material wealth, and discrimination based on race (see Barnshaw 2005).

Setting the stage for an analysis of greater depth, this chapter presents a preliminary series of relevant social responses and patterns upon which more detailed investigations can be built regarding evacuation decision making and rescue as experienced by those who were unable/unwilling to evacuate before Katrina's impact. Analysis of interview transcripts reveals that, contrary to media depictions that suggested animal-like, irrational behavior, or antisocial behavior, the experiences of many nonevacuees can be analytically understood not as resulting from the breakdown of social order, but as based on pre-event social factors.

Methods

Approximately three weeks after Katrina's landfall on the Gulf Coast region, researchers from the Disaster Research Center (DRC) at the University of Delaware arrived in Houston, Southern Mississippi, and Louisiana. Their purpose was to observe and document the social conditions that led to and resulted from the hurricane's impact. One researcher traveled to the Houston Astrodome and Reliant Convention Center. Remaining researchers—seven in total—were organized into two field teams, one team operated primarily in Southern Mississippi, and the other in Louisiana. Data collection methods included interviews (n=150), photography, film, and nonparticipant observation.

Research objectives varied considerably among DRC quick response personnel. Semistructured interview guides allowed researchers to explore a variety of subjects, including, but not limited to, organizational response, sheltering, warnings, evacuation, return decision making, reports of looting, and prosocial behaviors. Utilizing previous knowledge of the actions and needs of victims in the multiple phases of a disaster, researchers developed an interview instrument, prior to arriving in the Gulf Coast region, that focused attention on the aforementioned areas of interest. This instrument served as guide for discussions with interviewees and data collection, yet DRC researchers were free to explore themes that emerged during the course of this process. As a result, DRC quick response researchers had guidelines in collecting data that allowed for crosscomparison and the identifications of patterns, but also allowed the freedom required by the exigencies of interviewing victims in the field. This point is highlighted to address the preliminary nature of these suggestions and to augment the strict notion of adhering to formal guides. Rather, we focused on key issues that allowed interviewers to see interviewees as key informants rather than simply as respondents. Hurricane Katrina was a unique historical event and, as such, semistructured interviews permitted

respondents to have an active voice in generating discussion on the specific issues they experienced during Katrina.

Interviews were collected in a variety of locations including: mass care facilities such as the Houston Astrodome, the Reliant Convention Center, and a convention center turned shelter in Baton Rouge, Louisiana. These large facilities serviced the displaced in various numbers, ranging from 1,000 to 6,000 per shelter. Access to interviewees was granted through contact with managers and appropriate personnel onsite at these establishments. Interviews were also conducted at smaller structures such as predesignated and emergent community shelters (e.g., structures that became shelters after the storm, such as hotels), as well as within the homes of residents in areas impacted by the hurricane. Each interviewee was asked permission to document the discussion either by electronic recorder or live notetaking; they were also informed of the strict University of Delaware policy of protecting the identity of interview subjects. Interviews conducted ranged in length from 20 to 90 minutes and were administered by either an individual or pair of DRC researchers.

Our sampling strategy brought together convenience and snowball techniques with the intention of targeting both individuals and elite organizational actors impacted by this hurricane. Individuals encountered during the course of this reconnaissance trip were approached based upon their residency in care facilities or in regions that were physically impacted by the storm. Interviews with formal organizational responders were scheduled either through the mobilization of preevent relationships or by locating and scheduling meetings based on information that was collected, sorted, and filed prior to our field deployment. Often, these actors would inform DRC researchers of other relevant formal responders, care facilities or impacted regions in which to interview those charged with responding to or attempting to recover from Katrina. From the total stock of interviews, this study bases its findings on victims who, for a variety of reasons, had not evacuated prior to onset (n=39). A majority of these interviews were conducted in the aforementioned mass care shelters and at homesites in residential areas.

Although it was in many cases inappropriate, in initial interviews we encountered cultural resistance to answering many of the standard demographic questions; preliminary analyses and impressions suggest that the majority of respondents have similar socioeconomic backgrounds. We should also note, that a majority of this subset (n=25) were displaced persons in Houston—a mostly low-income, African American group whose recent flight from New Orleans led them to mass care shelters. It is also important to note that due to the levee breach and sustained flooding that many of our evacuees personally experienced, the insights of this sample are in some ways qualitatively different than those who had only experi-

enced hurricane impacts. Where appropriate and supported by our data, we discuss how these experiences differed from those of nonevacuees in Mississippi and other parts of Louisiana.

Content analysis of fieldwork notes and interviews were carried out using *AtlasTI 5.0*, a computer software program for textual analysis. The *Atlas* program allowed us to code and conceptualize the relevant textual passages in search of redundancy and variations between and within the multiple sources of data and then to extract that information in a manner amenable to qualitative analysis. The triangulation of multiple data sources and various perspectives throughout the project makes for a robust design that increases the validity of our findings.

Background and Review of Literature

Our approach to understanding this event is based on the principle framework lay out by sociologists that both dysfunctional social systems and cultural traditions give rise to and influence disasters. Observation and comparison nevertheless require us to qualify this adherence to convention: the objective features of a hazard—its duration, scope, and intensity, for instance—continually shape *how* people go about responding to it. There is a different dynamic at play for different hazards; some features in the social process of response become more or less salient. Hurricane Katrina, for instance, presents researchers with a valuable opportunity to study warning response and community evacuation within the context of a slow-onset event . The upshot is that Katrina allows us to examine a case in which a majority of the population was likely to be informed about the impending landfall , naturally allowing for a more controlled analysis of later stages of the response process, which are commonly modeled in the following manner: 1) Understanding the warning, 2) believing the warning is credible, 3) confirming a threat, 4) personalizing a threat, 5) determining whether protective action is needed, 6) determining whether protective action is feasible (Mileti 1999).

The forces driving these later processes are immanently social, involving interaction, communication, and collective definition. Research strongly suggests, moreover, that pre-existing social structures and emergent behaviors (Turner and Killian 1987; Aguirre, Wenger, and Vigo 1998) also play a role in shaping warning response and evacuation behavior. When it comes to warning systems, accuracy beyond a limited threshold would therefore hold diminishing returns (Diaz, personal communication 2006) for marginalized social groups, who, in the face of disaster, often experience obstacles to understanding, personalizing, and reducing risk. Also of great importance are characteristics of message and sender. Empirical studies in the fields of sociology, political science, and anthropology continue frequently and consistently to corroborate these ideas.

The dynamics behind warning understanding are well documented. It is known, for instance, that the probability of risk comprehension tends to increase with the dissemination of multiple warnings (Turner et al. 1979). Such findings would, however, appear to conflict with well-supported observations that warnings of greater specificity elicit greater levels of understanding (Perry 1983). Regarding means of communication, warnings channeled solely through the medium of sirens have been shown to elude public understanding (Tierney 1987; Lachman, Tatsuoka, and Bonk 1961); whether or not one believes a warning also remains contingent on factors rooted in the psychological, social, and cultural worlds victims inhabit.

Threat proximity, for example, is consistently acknowledged as a mechanism behind public response (Sorenson 1982): the likelihood of belief within warned communities located near a disaster is greater, which, of course, may be linked to the reality of greater response rates among those encountering environmental cues (Hammer and Schmidlin 2002; Mileti and O'Brien 1993; Tierney 1987). Evidence from research presents mixed findings regarding whether potential victims share a greater likelihood to believe warnings from official sources and media reports (Drabek 1994; Baker 1987) or "significant others" (Nigg 1987; Sorenson 1982). There is, however, a fundamental social process running through beliefs: the tendency among persons to define situations as normal. "People have a tendency to err on the side of normalcy," writes McLuckie (1973). "Conditions are evaluated as all right until proven otherwise. Therefore," he concludes, "the burden of proof is on the warning system." In the absence of nearby environmental cues, this "normalcy bias," described by Okabe and Makami (1981), triggers immediate *denial* on the part of potential victims. Defining a situation is necessary for action (Turner and Killian 1987) and such consensus is often produced through interaction. To be sure, there is strong evidence to suggest that the perception of immediate danger is a necessary factor in the decision to evacuate (Hammer and Schmidlin 2002). Similarly, as suggested by Aguirre, Wenger, and Vigo (1998) in the case of building evacuation, people often made the decision to evacuate or stay based on a collective emerging definition of the situation and appropriate lines of action. It would appear that this normalcy bias is a social construct, a manifestation of what Lefebvre (1987) calls an "everydayness" and what Goffman (1956) has famously termed a "definition of the situation," preserved by routine activities until some sort of disruption that signals "something is wrong here."

Risk personalization—or the perception that one is indeed under threat—is no less contingent upon social, psychological, and environmental factors. Mileti and Darlington (1997, 98) write, "Our most robust conclusion is to underscore the value of an interactionist perspective in explaining how actors convert new information into action." Repeated studies of earthquake response, for instance, demonstrate

through repeated observations that seeing others preparing for an event personalizes it (Mileti and Fitzpatrick 1992).

Resources—the availability of which may be either real or perceived—shape evacuation decision making. Both Balluz et al. (2000) and Baker (1979) show the presence of resources increases the likelihood of response. Yet others (Duval and Mulilis 1999) find clear evidence supporting the mere perception of resources as sufficient to motivate evacuation. Such findings naturally raise the question of whether the mere presence of resources is a necessary or sufficient condition for evacuation. Further skepticism might lead one to conclude the social construction of available resources to far eclipse in importance the mere availability of resources.

Culture is also a salient feature of Mileti's model. In particular, Perry and Hirotada (1991) offer an instructive analysis of values and their influence on sheltering behavior among U.S. and Japanese evacuees. The researchers found the greater likelihood of sheltering among the Japanese chiefly attributable to a "collectivist culture in which citizens have higher expectations that authorities will provide care in the event of disasters or other disruptions in social life" (112). Others (Aguirre 1988) find language a cultural artifact inseparable from the process of receiving tornado warnings, a finding suitably extended to slow-onset events, for there is little reason to believe that communication barriers play any less a role in the process of understanding, belief, and personalization.

In sum, due to the relatively effective dissemination of warnings issued for Katrina, this case allows us to methodologically isolate levels of warning receipt, which can be judged as having been relatively successful, from the social decision making and response activities. The logic behind such an argument draws on Mileti and Sorenson's (1990) system-level model of warning systems that posits the existence of three warning subsystems including detection, management, and response where integration (or lack thereof) forms the foundation of warning response. So conceived, Katrina, as a slow-onset event, presents a setting in which detection and management subsystems functioned well, but the response subsystem did not account for the variations in decision making in light of complex social characteristics. In the following we review some of the common explanations regarding why respondents did not evacuate.

The second example of community and social response we will highlight are the activities of emergent volunteers and community groups in the search and rescue (SAR) efforts. While these actions received relatively little attention in the press it is vital to note the degree to which community cohesion and social connectivity, as opposed to breakdown, led to a number of important response and life-saving efforts. As past works have highlighted, SAR activities are part of the mass assault

phase of disaster. As such, in addition to the organizational actors that receive attention and credit for these efforts, multiple individual and collective actors also participate. Many trapped victims are rescued by uninjured bystanders and surviving local emergency responders (Aguirre et al. 1995). These findings suggest that while reports were focused on looting, price gouging, and other such behaviors that research suggests are rare (Fischer 1998; Barsky, Trainor, and Torres 2006), the atmosphere of human solidarity and cooperation during and in the aftermath of the disaster were ignored. This work will briefly explore this issue.

Analysis of Nonevacuation Decisions

Receiving the Warning Doesn't Equal Heeding the Warning

It is interesting and important to note that, save one respondent, every one of our interviewees reported having heard about the impending hurricane. While the timing and source of the message varied, this finding to some degree supports the notion that advance warnings were issued in a relatively effective time frame. Respondents reported having received warnings from a variety of sources, most commonly from the media, friends, and family. In discussing message credibility, some respondents reported initial skepticism about local and national news coverage, which in a few cases led to inaction, but most believed the storm was coming.

Lack of Means

In looking at why people did not evacuate from the Gulf Coast region it is important to first recognize that for some of those involved staying was not one alternative among many, but rather the only alternative. Explanations that fit into this category ranged from physical immobility to threats of domestic violence, and in some areas reflected concerns about whether evacuation could be achieved in the short-term and sustained in the months to follow. As an illustration of this point, one interviewee estimated that only about half of the members of his community, which has historically experienced high levels of disability and poverty, owned cars. A church leader in the same African American community informed researchers that a majority of his parishioners earned low- to mid-level incomes. Whether or not one *intended* to evacuate, he said, was in many cases irrelevant, for even if one owned a car, major difficulties in acquiring gas, food, and lodging eliminated the possibility of evacuation for many. The costs associated with fleeing simply exceeded the means of many of those later trapped on the Gulf Coast.

According to some, the presence of a stronger initiative on the part of local government could have offset widespread socioeconomic deprivation cited as a principal cause of nonevacuation. Additionally, several respondents commented

on the lack of governmental plan to evacuate residents. As one respondent stated "the city wasn't offering no free way out. I mean you had to pay for a bus ride, a plane ride, a train." What we see here is that the individual, familial, and communal lack of resources impacted decision making in a manner that was further compounded by governmental failure to mobilize its resources and infrastructure—buses, trucks, and so on—to evacuate people, a suggestion that is echoed by the recommendations made in the Annals of the American Academy special issue on Katrina (Waugh 2006, 330). While these findings have been principally related to physical or material resources, cultural resources of an intangible nature, such as knowledge, should also be considered. For instance, one woman claimed she didn't evacuate because she "wasn't a highway person" and lacked knowledge of directions. Along these lines, one respondent commented on the lack of multiple evacuation destinations promoted by local government. In some cases, obstacles created by poverty and other means-based barriers to evacuations were overcome if victims' social networks extended beyond the community. This is illustrated by an interviewee who had few resources but was able to get out of the area and stay with her son. Despite the potential illustrated by cases such as this, it should be noted that in a significant number of instances the presence of weak personal ties was not beneficial when one considered their fragmented and spatially concentrated nature (Grannovetter 1973; Burt 1992; Wasserman and Faust 1994; Barnshaw forthcoming; Barnshaw and Trainor 2006).

Past Experiences and the Impending Reality

Past experience with hurricanes appeared to play a vital role in whether warnings were acted upon, echoing an all-too-common pattern observed among disaster victims: one may understand and, furthermore, believe a warning to identify a *real* threat, while at the same time denying or downplaying the possibility of personal risk. Among victims of Katrina, the rationality behind such a denial generally fell into two categories. We label them "wishful-thinking" rationality and "never-before" rationality.

Wishful-thinking offers a noteworthy example of how the general nature of warnings is such that they are not personalized by intended recipients, which results in a lack of action. While this group did not give many explanations about why they felt they were safe, some tied the idea to how important their homes were to them and how it provided a sense of calm that was preferable to alternative options, an issue that should be explored in more detail. Our admittedly limited data in this regard allow us only to suggest that this group of respondents knew the storm was predicted, but simply hoped it wouldn't hit their area. This perspective is illustrated by the following quote: "I never had too much worries about it because I just thought it was going to go eastward, you know, wishful thinking I guess."

The second category, "never before," is composed of people who had ridden out previous events unharmed or fairly well. This group of respondents had experienced other hurricanes including Betsy (1965) and Camille (1969), but viewed the potential impacts of the storm, based on their previous experiences, as an acceptable level of risk. In many instances these people had experienced some previous damage or destruction, but believed that they knew the limits of what a hurricane could do. When these residents combined the inconveniences of evacuation, displacement, and traffic jams against their past experiences, they felt staying in place was a better alternative.

Most respondents had a lay understanding of terminology and the concepts used to convey information about Hurricane Rita. For instance, when Rita achieved Category 5 status, many interviewees took this as a cue to begin either evacuating or making preparations to do so. Several other respondents, however, mentioned that they wish they had known how Katrina would compare to other storms in a way that was meaningful to them rather than based on a number scale they only roughly understood.

Normalcy Bias

Although many in the region received advance warning of Katrina and understood basic terminology such as hurricane categories, few took action until visible floodwaters, dark skies, or violent winds removed the veil of everyday routine. It was only then that interviewees evacuated—too late, in some cases. Fear of looting, inadequate preparation, and failure to obtain vital supplies constitute additional reasons for postponing evacuation. One interviewee suggested that voluntary evacuation evokes less fear and concern than mandatory evacuation. Initially hesitant to evacuate, one respondent suggested that a normalcy bias may have been reinforced by local institutions. Some employers insisted employees remain at work, for instance, a decision conceivably lending to many a sense of familiarity and routine in spite of predictions of a real, yet ultimately distant threat. In another instance, one woman resisted departing New Orleans owing to loyalty: according to her statements, she had been on the job for 26 years and "*wasn't* going to just leave." The insistence of her family appeared to be the only factor motivating her departure. She traced her resolve back to experiences with her grandfather who gave highly questionable advice such as "hold on to the gutter." Illustrating the continuing impact of fears about looting on evacuee behavior, she noted that a recent divorce had cost her a great deal and she feared looters would take what she had begun to rebuild of her life. Another interviewee replied that the impetus for his departure was "seeing dead bodies." In other cases, prolonged inaction may have simply been due to a risk-benefit analysis: do the risks of being caught in Katrina outweigh the benefits of keeping my job? In some cases, greater emphasis

was placed on the latter, particularly for poor interviewees whose day-to-day survival depends on a reliable income.

The options for evacuees proved to be unappealing to some respondents. There were many shelters designated prior to Katrina, as well as several sites designated as a refuge of last resort (Nigg, Barnshaw, and Torres 2006). A refuge of last resort is a physical space intended to provide the best protection possible against a hurricane. Unlike a predetermined shelter, a refuge of last resort may not have the customary supplies that a standard shelter would (food, clothing, utilities). Standard shelters, such as the Superdome or the New Orleans Convention Center, housed many occupants and led to now historic and horrific experiences. Whether or not interviewees could have foreseen these conditions, the options for shelter were unappealing to many, a perception that will likely be exacerbated in the wake of Katrina, and many interviewees conveyed this feeling. It is likely then that a fair degree of the apprehension over traveling to structures not intended for such purposes, to wait out the storm, , inhibited evacuation. As one respondent expressed it, "I was on the ground floor apartment at that time . . . but, um I had some windows break and a little roof damage, . . . but, uh, I rather be at home than be at a shelter with all these people, ya know. Like I had food that was still leftover. I still have about 45 cans of tuna."

The Role of Social Bonds

Disasters evoke a predisposition among victims toward collective action. Katrina was, in many cases, no different: social bonds defined whether and how to evacuate. In many cases, the activities of keynoters—found most likely to be family, friends, and others within one's primary group sphere—defined Katrina as a situation to which evacuation was the most appropriate response. Such were the accounts of many respondents. In many cases, discussions with family members and neighbors dissuaded earlier intentions to "weather the storm." Other accounts suggest significant others offered crucial advice as to appropriate courses of action. Although more in-depth examinations of this pattern is beyond the scope of this investigation, it is our preliminary perception that both the decision to stay and, especially, the decision to leave were heavily influenced by collective decision making among family and neighborhood groups. This finding also parallels Clifford (1956), who demonstrated that personal channels or the actions of significant others reinforce personal beliefs.

As a variation on this theme it is important to note the influence of power and inequity in these processes as exhibited in examples of gendered inequality. As a special case, gender inequity is a social reality that previous research suggests does not change during disaster events (Enarson and Morrow 1997; Nigg and

Tierney 1990) and may even force women to face greater obstacles in a disaster. While some findings suggest that women evacuate at higher rates during a hurricane (Bateman and Edwards 2002), possibly due to their propensity to respond to warnings more so than males (Drabek 1969; Turner et al. 1980), an isolated case we encountered may reveal an overlooked factor in evacuation response worthy of further investigations. One respondent in a shelter from Biloxi indicated that while she wanted to leave, threats from her boyfriend prevented her from doing so. During the event, he attacked her, breaking her ribs, making it impossible for her to leave without his consent and assistance. She eventually left with her sons, her attacker, and two other family members. While we often view evacuation as an individual process, it should be considered, as is discussed in the instance of building evacuation, that such decisions are group based and strongly affected by patterns of affiliation (Aguirre et al.1995). In such instances, it may be appropriate to view the evacuation decision making process in the context of familial and domestic relationships, which encourage and prohibit decision making among females as in the case of our respondent who suggested, "I was more afraid of him than afraid of dying."

After the Storm

Deciding to Leave.

For many, Katrina's aftermath brought equally difficult questions about departure. Leaving the coast after the storm would present its own challenges; adding to the problem of long-term sustainability was now a terrain rendered, in many cases, nothing short of impassable. Major flooding in New Orleans following well-known levee breaches destroyed a majority of the city and trapped thousands, leaving those stranded dependent on outsider vehicles, boats, and helicopters for rescue.

Decisions to leave, for many respondents, were based largely on the physical danger their homes presented, but were also significantly influenced by other more social factors including continued family and community pleas and the local knowledge of rescuers from within the community.

Organizational Search and Rescue

Many response agencies engaged in the extrication of survivors stranded due to flooding and storm surge. The National Guard, Coast Guard, Department of Defense (DOD), FEMA's Urban Search and Rescue (USAR), and local and state personnel engaged in rescue activities by boat and by air in order to rescue those who had stayed behind in the impact zones. From the efforts of these agencies more than 60,000 people were saved (U.S. House of Representatives 2006, 116). Although

these organizational resources accomplished a vast number of rescues, they could not (or did not) attend to the needs of all those who were impacted. The sheer scale of the event meant that even with the most advanced technologies these organizations could not locate, attend to, and answer all the requests placed upon them. Additionally, the pressures to act quickly in order to save the extraordinary number of stranded individuals also created unintended social consequences for those who were evacuated. In looking at several criticisms, we see that rescuers often failed to record the names of those rescued, and the locations they were taken to, which resulted in the separation of families (U.S. House of Representatives 2006). Here, however, we will examine the degree to which informal networks assisted this process and how local cultural knowledge among these populations guided rescue operations and informal response efforts. As suggested by Aguirre et al. (1995) in another context, it appears that many victims were rescued after impact by people they knew. Although there was a large presence of formal organizations that completed a large number of rescues, the importance of social networks and localized knowledge aided those who may have otherwise been overlooked.

Search and Rescue: A Community Effort

The fact that organizational rescuers were overwhelmed led nonevacuees to engage in search and rescue, a process that required many to improvise and gather resources, sometimes in illegal ways. While it is a common understanding in sociological disaster literature that looting is a myth (Quarantelli 1994; Gray and Wilson 1984) many of us saw reports where real looting occurred, particularly in New Orleans, and others freely admitted to taking property that belonged to others. We suggest, however, as have others, that the taking of essential items can also be prosocial, a type of activity labeled "appropriating behavior." While the most common example of this activity was items taken for subsistence (Barsky 2006; Barsky, Trainor and Torres 2006), another example of this prosocial behavior was the taking of boats to conduct informal search and rescue operations. When faced with a potentially fatal situation, many nonevacuees took measures to ensure the timely rescue of those neglected by the lack of unified and accurate rescue response.

Informal bonds present in impacted regions facilitated rescue from the aftermath of Hurricane Katrina. Many nonevacuees commented that when they were not rescued by organizational responders in a timely manner they banded together, which resulted in many respondents reporting being saved by neighbors in either their own or appropriated boats.

In addition, it is important to note the degree to which pre-existing knowledge served to inform a rescue agenda. One interviewee who became a leader in water rescue described how he took authority and set up a hierarchy; saving the elderly

and children was a priority. Based upon pre-existing knowledge, these nonevacuees knew where to go to save those most at risk. Residents in disaster-impacted regions generally engage in volunteer-related behavior, and a sense of social solidarity increases (Dynes, Quarantelli, and Wenger 1990). This phenomenon was often mentioned by our interviewees in reference to the informal rescue process, which often evolved into an organized effort.

Travel and Rescue

The process of travel during the rescue phase proved to be an added difficulty for nonevacuees. Leaving prior to Katrina allowed people to choose a location to ride out the storm and its aftermath; this was not generally so for nonevacuees. Once rescued from rising waters, many waited among large crowds on the I-10 bridge, as well as in similar locations, for shelter transportation. These sites predominantly had no utilities, bedding, or clothing. Food in the form of military MRE's (meals ready to eat) were dropped but, as some complained, there were no directions about how to use them. Often respondents mentioned uncomfortable conditions, barely managed by authorities (National Guard, local law enforcement, etc.) sent to govern evacuation. The rescued endured long lines, waiting hours to get on a bus to travel, and then endured what may have been an eight-to-nine-hour drive to a shelter.

Conclusion

The slow nature of Hurricane Katrina's onset allows researchers to look more closely at the warning and response capabilities of the communities in Mississippi and Louisiana. What emerged from this initial analysis reaffirms a series of insights that have been written about numerous times, all of which suggest the continued importance of social situations and community context. While most people knew of the hurricane in advance, many were either incapable of grasping the full meaning of warning messages or unable to act, or both. Even some of those with detailed information regarding the storm's category, direction, and intensity did not evacuate; some believed they could weather the storm in their homes or were either physically or socially limited in their ability to act on the warnings. It is also important to note that evacuation and protective action were not choices made in isolation. In reality, many of the protective actions taken were done in concert with others—above all, with friends and family members.

The general finding is that all phases of warning response/hazard response, from understanding, to credibility, to action, are social processes (Mileti 1999). They are social processes in the sense that they often involve interactions within groups in order for the process to be carried out. They involve communication,

interpretation, social control, collective behavior, and other such activities common during disasters. Our understanding and interpretation of major events, therefore, should continue to take into account the collective nature of warning, response, and disasters in general. Only in doing so can we develop a more accurate picture of the warning process and, as a result, experience more successful responses. Additionally, we were able to talk to a surprising number of interviewees who were shelter residents at the time of our meetings, but had remained in their homes when the hurricane struck. While some did not evacuate due to a lack of means there was also a significant number of respondents who gave alternate reasons as to why they chose not to evacuate. In looking at this group as a whole, the decision to not take protective action (i.e., evacuation) was very closely tied to three important social phenomenon: lack of means, a collective decision making process that defined home as a safer or better alternative to evacuations, and (in many cases) a "normalcy bias" that allowed them to view the emerging dangers as routine.

Finally, interviews about the rescue/escape process following the storm's impact suggested an important role for prestorm community ties and local cultural knowledge in grassroots rescue efforts. Where organizational rescue response was unable, or failed, to assist, informal networks helped these nonevacuees. The altruistic nature commonly found among disaster victims manifested itself in the wake of Hurricane Katrina, offering an alternative interpretation of behavior to the "animalistic" views produced by mainstream media.

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Southeastern Louisiana Evacuation/Nonevacuation for Hurricane Katrina

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Abstract

Lack of evacuation of many residents of hurricane-vulnerable areas of the Gulf Coast has been a concern, and research may aid in understanding the differences between evacuators and nonevacuators. Interviews of residents of seven southeastern Louisiana parishes for which evacuation orders were issued for Hurricane Katrina were conducted in October 2005. Due to difficulties related to population displacement and access, convenience sampling was utilized. A total of 350 interviews were conducted, with 345 usable for analyses. Data were analyzed based on a number of variables found to be of potential significance to hazard response. For the most part, results confirm the findings of related research—race, income, education, and gender matter, and follow expected relationships. Some results differ, however, particularly related to age, pets, and presence of the handicapped in the household. Differences may be related to the sampling methods, but further investigation may be warranted.

Keywords: evacuation, decision making, New Orleans, Louisiana, hazard response, risk communication

By the night of Friday, August 26, 2005, the likely landfall of Hurricane Katrina in the New Orleans/Gulfport area was clear, and the governor of Louisiana declared a state of emergency. Voluntary or mandatory evacuation orders were issued for New Orleans (Orleans Parish) and seven other parishes on Saturday (Jefferson, Lafourche, Plaquemines, St. Bernard, St. Charles, St. Tammany, and Terrebonne) (Nolan 2005). On Sunday morning, Katrina was declared a Category 5 storm while still in the Gulf of Mexico. Widespread direct devastation from hurricane wind and storm surge was experienced in the delta parishes of Plaquemines and St. Bernard as the hurricane made landfall Monday morning. In the early morning hours of Monday, August 29, the eye of Katrina passed over New Orleans. Though not considered a primary storm impact, the secondary effects of levee failure around New Orleans caused Lake Pontchartrain water to inundate the city to depths of as much as 20 feet (Graumann et al. 2005).

The likelihood that a major hurricane could cause devastating flooding in New Orleans was well understood by many scientists and emergency personnel ahead of time (see Laska 2004, Travis 2005), and had received attention by *The Times Picayune* newspaper of New Orleans with a prominent series of articles in June 2002. However, in spite of evacuation orders, thousands of people remained in New Orleans and surrounding parishes, many not even moving to local shelters. New Orleans researchers had recently conducted research that indicated that a large proportion of poorer residents would not evacuate even when an evacuation order was made, due to a lack of transportation (Travis 2005).

The purpose of this study is to investigate potential differences between predisaster evacuees and those not evacuating "in time." In particular, better understanding of the characteristics and situations of those not evacuating, and so maintaining a place of enhanced vulnerability in the face of a known hazard, may help to improve future evacuation research, planning, and public communications.

Hazard Evacuation Studies

Vulnerability of human populations in particular places is determined by natural environmental characteristics, human use and modifications to the environment, and social organization (see Mileti 1999; Tierney et al. 2001; Oliver-Smith 2004). New Orleans and coastal communities were vulnerable because of their physical locations, and because of the social, institutional, and economic conditions that marginalized some members of the population. According to Bolin and Stanford (1998, 9–10),

> Vulnerability concerns the complex of social, economic, and political consideration in which people's lives are embedded and that structure the

> choices and options they have in the face of environmental hazards. The most vulnerable are typically those with the fewest choices, those whose lives are constrained, for example, by discrimination, political powerlessness, physical disability, lack of education and employment, illness, the absence of legal rights, and other historically grounded practices of domination and marginalization.

A number of researchers have focused on social, psychological, economic, demographic and geographical variables influencing public construction or perception of risk; response to hazards, hazard warnings, and evacuations; and risk response (e.g., Balluz et al. 2000; Dow and Cutter 2000; Drabek 1996; Lindell and Perry 1992; Masuda and Garvin 2006; Mileti 1995, 1999; Mileti and Peek 2000; Quarantelli 1994; Sorensen 2000; Sorenson and Mileti 1987; O'Brien and Payne 1997; Taylor-Gooby and Zinn 2006). Although researchers expect that well-designed communication campaigns should improve public response to hazard warnings and evacuation mandates (Blanchard-Boehm and Cook 2004), factors related to residents' response to calls for evacuation include individuals' characteristics and the specific warning messages (Perry 1994).

Research often places emphasis on real or potential differences in hazard response between racial or ethnic groups, men and women, the elderly and nonelderly, groupings based on income, and groupings based on education (Cutter et al. 2003). A variety of other factors also come into play, including hazard notification (source and speed), shelter options, pets in the household, and past experience with the specific hazard (e.g., Cutter et al. 2000; Fothergill et al. 1999; Mitchell et al. 2005; O'Brien and Payne 1997). Dow and Cutter (2000), for example, found an inverse relationship between pet ownership and compliance with evacuation orders.

Fothergill and Peek (2004) concluded that the poor in the United States are more vulnerable to natural disasters due to such factors as place and type of residence, building construction, and social exclusion. Their extensive review of sociological studies of the relationship of poverty to hazard-related behavior indicated that the poor are "less likely to prepare for hazards," though some researchers (Gladwin and Peacock 1997) have found no relationship between income and preparation time. Fothergill and Peek (2004) also identified several studies that indicated a lower likelihood of receipt or belief in hazard warnings by people with lower socioeconomic status; some studies have "found no relationship between socioeconomic status and warning response," however. In their study of warnings and evacuation for Hurricane Andrew, Gladwin and Peacock (1997) reported that people with lower incomes were less likely to evacuate—mostly related to a lack of transportation. They also reported that poor households had fewer options for shelters than more affluent households.

According to Mileti (1999, 227), among other factors,

> household preparedness activities are more likely to be undertaken by those who are routinely most attentive to the news media (i.e., those who are educated, female, and white); . . . have personally experienced disaster damage; are responsible for the safety of school-age children; . . . and can afford to take the steps necessary to get prepared.

How particular groups receive hazard information has come into question (Perry and Nelson 1991; Turner et al. 1986). Trust can be an issue (Kasperson et al. 2005a, Kasperson et al. 2005b), so that individual perceptions of information sources and authorities can be a concern when it comes to hazard response. Ethnicity has been implicated as a factor in risk perceptions, confidence in science, and attitude about government agencies (Lindell and Perry 1992). Riad et al. (1999) specifically found that African Americans were significantly less likely to evacuate for hurricanes Hugo and Andrew than either Caucasians or Latinos. For Hurricane Hugo, Faupel et al. (1992) concluded that minority communities had less opportunity to participate in the preparedness stage.

Because of the preponderance of African Americans affected by nonevacuation from New Orleans prior to landfall of Hurricane Katrina, as indicated by widespread media coverage of conditions in New Orleans and specifically at the Superdome and Conference Center post-Katrina shelters, a great deal of attention has been paid to the role of race in affecting vulnerability and evacuation. A recent study by Elliott and Pais (2006), based on survey data collected from over 1,200 Katrina survivors who had contacted Red Cross aid, concluded that both race and class played important roles in shaping public response to Hurricane Katrina. They found that black residents across the region were less apt to evacuate prior to the storm than were white residents, and that poor, inner-city residents were less likely "to heed formal evacuation warnings" than other groups, some due to lack of transportation and others due to failure to take warnings sufficiently seriously. Lavelle and Feagin (2006) concurred with the findings that race and class made a difference to evacuation decisions.

Given prior hazard response and vulnerability literature, a number of expectations can be put forward regarding evacuation behavior in southeastern Louisiana in response to evacuation orders for Hurricane Katrina. Preimpact evacuation rates likely were lower for persons with low levels of education, low income levels, age over 65 years, with pets, minority racial/ethnic status, and low trust in potential sources of information or government authorities. These potential relationships are explored below.

Methods

Social and geographical factors related to compliance with hurricane evacuation orders in southeastern Louisiana were investigated through interviews of persons who had lived in seven parishes for which evacuation orders were issued (in whole or in part) (see Figure 1). Questions included an opportunity for respondents to describe their experiences with Katrina, as well as a number of objective questions related to basic respondent characteristics (income, household size, age, home type, home location) and questions relevant to issues of information sources and trust. A portion of the questionnaire used for this research was modeled after a 2004 study of the Southeast Louisiana Hurricane Taskforce (Howell and Bonner 2005) in order to facilitate comparison of pre-Katrina and post-Katrina evacuation survey responses. Analyses were done through use of descriptive statistics, bivariate (chi-square) tests, and logistic regression.

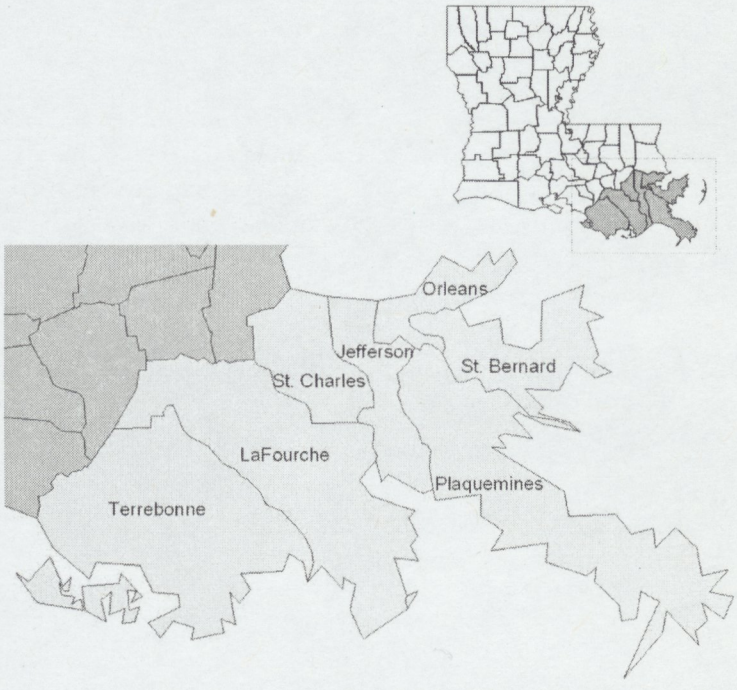


FIGURE 1: Study Area Parishes and Location in Louisiana

A team of two faculty members and three graduate students traveled to southeastern Louisiana for one week of data collection in October 2005. Because a largely displaced population made true random or stratified sampling impracticable, convenience sampling was used (approaching potentially available individuals).

Respondents were interviewed in two shelters and outside four discount stores (three Wal-Marts and a Big K-Mart). The shelters were in Thibodaux (Terrebonne Parish), visited in order to obtain evacuee interviews just prior to the shelter's closure, and Gonzales, (between Baton Rouge and New Orleans), a shelter still in operation in the region at the time of our field work. (Two opportunity-based non-shelter interviews were done in Terrebonne Parish, as well.) Discount stores were located near New Orleans in Kenner and Jefferson (Jefferson Parish), Mathews (Lafourche Parish), and Luling (St. Charles Parish). Discount stores are frequented by a wide range of people, in terms of income, education, age, and race/ethnicity. The specific stores were chosen because a) they were open and located in the study area near the pre-Katrina center of population, b) managers gave permission for interview setups near the front doors, c) interviews generally could be conducted in shady areas, to the best extent possible, without asking interviewees to sit or stand in the heat of the sun. Additionally, at one location FEMA personnel also were set up in front of the store to aid area residents, which was seen as potentially making more interviewees available for this effort. Of 350 interviews conducted, 345 were usable.

It must be stressed that sampling was not random and therefore cannot be regarded as generalizeable to the experiences and characteristics of all pre-Katrina inhabitants of southeastern Louisiana. Many residents had not returned to the region (and, indeed, still have not returned). Additional interviews at shelters would have been desirable, but few shelters remained open in the region at the time. St. Charles Parish residents apparently were over-sampled (see Table 1). This may be

TABLE 1: Pre-Katrina residential locations of interviewees, with reference parish populations

Parish	2000 Census	Proportion of area population (%)	Sample n	Sample proportion (%)
Orleans	484,674	38	93	27
Jefferson	455,466	36	98	28
St. Bernard	67,229	5	17	5
Plaquemines	26,757	2	3	1
St. Charles	48,072	4	79	23
Lafourche	89,974	7	51	15
Terrebonne	104,503	8	4	1
Total	1,276,675	100	345	100

due to the likely easier return of residents to homes in this particular parish than to parishes like Orleans, St. Bernard, Plaquemines, and Jefferson, as well as due to sampling locations and ease of access from St. Charles.

Results

Two-thirds (67 percent) of the interviewees in this study were female and one-third (33 percent) was male. Women, who made up only slightly over half the population before Hurricane Katrina, were thus overrepresented in the sample. This may be related to interview locations and gendered shopping patterns, and may also relate to a gender bias in willingness to participate in interviews. Slightly over half of the respondents (53 percent) were Caucasian/white; 39 percent were African American/black; five percent were Hispanic, Asian, and American Indian; and three percent were other/unknown. In comparison, the 2000 census indicates that the study area was made up of a population that was 56 percent white and 38 percent black, so the racial sample makeup was very near that of the region. Ages ranged from 18 to 84 years, with an average of about 47. Total household income for 2004 ranged from very low to comfortably high (see Table 2). Median household income for the area averaged somewhat over $37,000 for 2003; our sample thus appears to reflect a somewhat lower median income than would a random sample. Education levels also ranged from very low (less than ninth grade) to high (postgraduate degree completion), essentially a bell-shaped distribution (see Table 3).

TABLE 2: Sample household income distribution for 2004

Household Income (2004)	Proportion of Respondents (%)
<$10,000	15
$10,000 – 14,999	12
$15,000 – 24,999	17
$25,000 – 34,999	14
$35,000 – 49,999	10
$50,000 – 74,999	17
$75,000 – 100,000	6
>$100,000	6

TABLE 3: Respondent education

Educational Level	Proportion of Respondents (%)
< 9th grade	4
Some high school	14
High school graduate	42
Some college, or technical school graduate	22
4-year college graduate	11
Postgraduate education	6

TABLE 4: Interviewees, by parish

Parish	Pre-landfall evacuation n (% of parish sample)	Pre-landfall non-evacuation n (% of parish sample)	Total
Orleans	50 (54)	43 (46)	93
Jefferson	70 (71)	28 (29)	98
St. Bernard	13 (77)	4 (24)	17
Plaquemines	2 (67)	1 (33)	3
St. Charles	75 (95)	4 (5)	79
Lafourche	42 (82)	9 (18)	51
Terrebonne	3 (75)	1 (25)	4
Total	255 (74)	90 (26)	345

A majority of those interviewed had evacuated in some way before Katrina arrived (see Table 4), although some of the evacuations were only to nearby homes or buildings (some of which proved insufficient following levee breach). Pre-landfall nonevacuation includes both those who were forced to evacuate after Hurricane Katrina made landfall, and those who never evacuated. In our sample group, those who evacuated after landfall outnumbered those who did not evacuate at all (see Table 5). Ninety interviewees either had to evacuate after landfall, or never evacuated; 56 evacuated "after they should have," and 34 did not leave, either before or after landfall.

It should again be stressed that these results apply only to the interviewees included in this study. Although Table 4 indicates that 54 percent of the Orleans Parish *respondents* had evacuated prior to landfall, for example, this figure should not be interpreted as reflecting the proportion of the population that evacuated prior to landfall. Because so many residents of Orleans Parish had been forced out of the area (either evacuating before or after landfall), the sampling was biased against New Orleans evacuees simply because they were out of the area (see Table 1).

Our sample indicates that African Americans were less likely to evacuate ahead of the storm than other racial or ethnic groups (see Table 5). Only 59 percent of African American respondents evacuated ahead of Hurricane Katrina's landfall, as compared to 84 percent of Caucasian/white respondents and 91 percent of members of other groups. Not surprisingly, there is a clear trend of higher evacuation rates with both income (see Figure 2) and education (Figure 3). From a low of 61 percent of those with a 2004 household income of less than $10,000, to a high of 86 percent of those with annual household income exceeding $100,000, there is a visible increase in proportion of respondents evacuating ahead of the storm with each higher category of income. Likewise, a distinct progression from lower to higher pre-landfall evacuation rates is evident for increasing education levels (see Figure 3).

TABLE 5: Race/ethnicity and evacuation rates

Racial or ethnic identification	Pre-landfall evacuation n (racial group %)	Post-landfall evacuation n (racial group %)	No evacuation n (racial group %)	Total
Caucasian /white	154 (83.7)	10 (5.4)	20 (10.9)	184 (100)
African American/ black	80 (58.8)	44 (32.4)	12 (8.8)	136 (100)
Other	20 (90.9)	1 (4.5)	1 (4.5)	22 (100)
Total*	254	55	33	342

*Pearson chi-square = 45.54 (df = 4), significance = 0.000

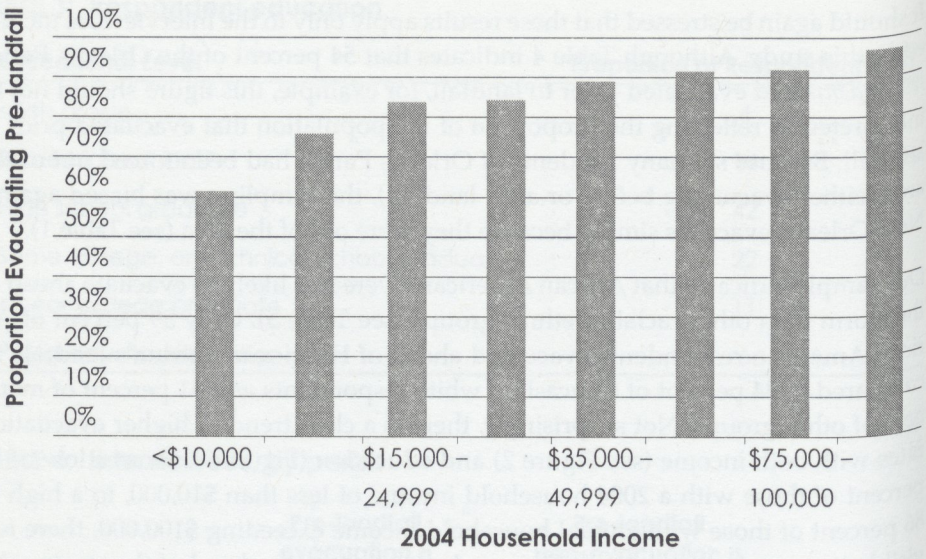


FIGURE 2: Income and Pre-landfall Evacuation Rates

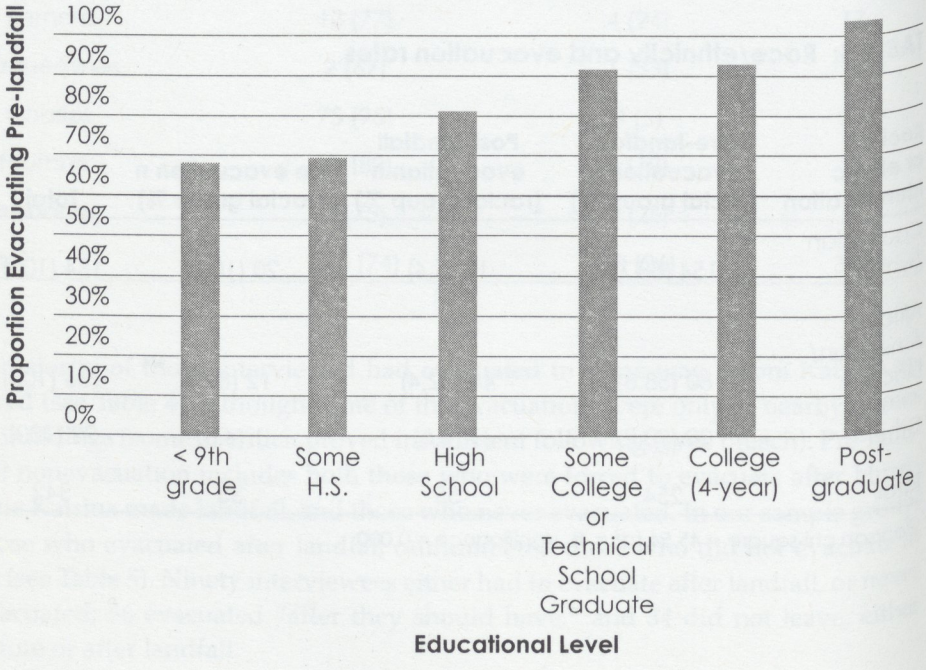


FIGURE 3: Education and Pre-landfall Evacuation Rates

TABLE 6: Interview sample female and male evacuation rates

Gender	Pre-landfall evacuation n (gender %)	Post-landfall evacuation n (gender %)	No evacuation n (gender %)	Total
Female	184 (79)	25 (11)	23 (10)	232
Male	70 (63)	31 (28)	11 (10)	112
Total*	254 (74)	56 (16)	34 (10)	344

*Pearson chi-square 16.15 (df=2), significance = 0.000

Women were more likely to have evacuated ahead of Katrina than men (see Table 6). Seventy-nine percent of women interviewed evacuated ahead of hurricane landfall, as compared to 63 percent of men. In contrast, 28 percent of men interviewed had to evacuate after landfall, with less than half that proportion of women evacuating postlandfall (11 percent). Percentages of interviewees that never evacuated were equal for women and men. That women are more likely to take action to assure safety generally is in keeping with the understanding of gender differences in hazard response.

It is generally believed that the elderly are less likely to evacuate than those who are younger. However, our research indicates that there was virtually no difference between pre-landfall evacuees and nonevacuees, based on average age: evacuees averaged 47 years (ranging from 18 to 84) and nonevacuee respondents also average 47 (ranging from 18 to 81). The elderly were well represented in our sample, with 15 percent (52) of the respondents 65 or older. Based on the proportion of older people evacuating, the elderly were much more likely to leave ahead of Katrina than to remain in place: 88 percent of our older respondents evacuated ahead of Katrina.

Consideration of the traits of nonevacuators and those forced to evacuate postlandfall (together comprising pre-landfall nonevacuators) is important to our understanding of what may affect their decision making. Responses indicated most pre-landfall nonevacuators had cars (see Table 7); however, among those forced to evacuate after landfall, a minority had their own cars (28 of 43 late evacuees did not have cars). A majority of those who said they did not have a car *did* have access to transportation. A majority of late and nonevacuees *did* know of potential shelters, although a large proportion did not. If faced with the same circumstances again, a majority of those who stayed said they *would* evacuate. Those in our survey who evacuated ahead of landfall were almost evenly split between those who already had evacuation plans and those who did not (131 with plans versus 124

TABLE 7: Selected characteristics of Hurricane Katrina pre-landfall nonevacuees (those who evacuated late or never)

Evacuation-relevant trait	Transportation			Shelter		Attitude toward future evacuation		Evacuation plan	
Response category	Had car	No car, but had transportation access	Had no transportation	Knew of shelter	Did not know of shelter	Would now evacuate for a major hurricane	Would not evacuate for a major hurricane	Had a plan	Had no plan
Number (trait group percentage)	41 (55%)	20 (27%)	14 (19%)	44 (59%)	31 (41%)	63 (86%)	10 (14%)	38 (43%)	51 (57%)
Total trait responses	75 (100%)			75 (100%)		73 (100%)		89 (100%)	

TABLE 8: Expressed level of trust in television sources of information

Level of trust	Pre-landfall evacuation n (% of evacuees)	Pre-landfall nonevacuation n (% nonevacuees)	Total
High	174 (69)	44 (49)	218
Medium	68 (27)	34 (38)	102
Low	12 (5)	12 (13)	24
Total*	254 (100)	90 (100)	344

*Pearson chi-square = 13.8 (df = 2), significance = 0.001

without), but those not evacuating ahead of time were more likely *not* to have an evacuation plan (Table 7).

Factors that often are assumed to be important to evacuation/nonevacuation decisions, but that did not show a strong relationship with evacuation, can be important to recognize. Among our interviewees, having had a home damaged in a prior hurricane did not have a significant relationship with evacuation, nor did pet ownership. Presence of disabled persons in the household also did not exhibit a significant statistical relationship to evacuation decisions in our sample. The presence of children in the household (either considering the presence of children under 15 years of age, or the presence of children under five) was not significantly related to evacuation at the 0.05 level. However, at the 0.10 significance level, the presence of children (either under 5 or under 15) was significant.

Use of and trust in television sources for hurricane information was widespread (see Table 8). Some respondents mentioned specific television stations and/or personalities.

Trust in local, state, and federal governments was highly variable (see Table 9). Those who did not evacuate prior to hurricane landfall expressed low levels of trust in local and state governments. Thirty-nine percent of nonevacuators (including both late evacuators and those who never evacuated) placed low trust in local government; fewer—24 percent—of evacuators found local government to have low trustworthiness. Among evacuators, a higher proportion placed high trust, rather than medium or low trust, in local government. State government was somewhat less trusted in both groups, but nonevacuators still expressed least trust: 41 percent of nonevacuators said they had low trust in state government, and 28 percent of evacuators said they had low trust in state government. Among evacuators, the greatest proportion of respondents expressed

TABLE 9: Trust in government by hurricane evacuees and nonevacuees

Government level	Expressed level of trust	Pre-landfall evacuation n (% of evacuees)	Pre-landfall nonevacuation n (% nonevacuees)	Government level total
Local	High	94 (37)	22 (24)	116
	Medium	99 (39)	33 (37)	132
	Low	61 (24)	35 (39)	96
State	High	81 (32)	22 (24)	103
	Medium	101 (40)	31 (34)	132
	Low	72 (28)	37 (41)	109
Federal	High	81 (32)	31 (34)	112
	Medium	82 (32)	26 (29)	108
	Low	90 (36)	33 (37)	123

Local – Pearson Chi-square = 8.47 (df = 2), significance = 0.014
State – Pearson Chi-square = 5.14 (df = 2), significance = 0.077
Federal – Pearson Chi-square = 0.40 (df = 2), significance = 0.817

medium trust in state government. The federal government is least trusted by both groups of respondents, and there is no significant difference between evacuators and nonevacuators with respect to trust in the federal level of government. Trust in government may well have been affected by post-Katrina experiences, and so may have reflected recent experience more than pre-Katrina trust levels. Thus, though opinions often seemed to have developed over much longer time frames, interpretation of these data must be done with great care.

Comparison with 2004 Hurricane Taskforce Survey

In 2004, the Southeast Louisiana Hurricane Taskforce (HTF) conducted a survey to determine likely hurricane evacuation responses (Howell and Bonner 2005). Study areas for HTF and for the research reported here overlapped, and some of the results for the relevant HTF locations are shown in Table 10. Most of the telephone interviews done as part of the 2004 study were completed prior to Hurricane Ivan, but responses from St. Charles Parish may have been affected by Ivan (September 2004), unlike responses from other parishes.

The Hurricane Taskforce (Howell and Bonner 2005) study indicated that a majority of residents would likely ("probably" or "definitely") evacuate if it were recommended by public officials. Our sample yielded evacuation rates generally above

Table 10: Likelihood of evacuation, as reported to interviewers in 2004 (from Howell and Bonner 2005)

Parish	Would evacuate in hypothetical scenario (%)[a]	Would definitely evacuate in hypothetical scenario (%)	Evacuated in last recommended evacuation (%) (hurricane)
Orleans (pre-Ivan survey)	70	30	36 (Georges)
Jefferson (pre-Ivan)	70	27	46 (Georges)
Lafourche (pre-Ivan)	69	31	28 (Georges)
St. Bernard (pre-Ivan)	66	30	46 (Georges)
Plaquemines (pre-Ivan)	80	41	53 (Lili)
S. Terrebonne (pre-Ivan)	73	41	42 (Lili)
St. Charles (post-Ivan)	78	52	71 (Ivan)

a. "Probably" or "definitely" would evacuate if recommended by public officials in parish.

70 percent, corresponding with the evacuation rates indicated by the HTF survey, with two exceptions. The rate we obtained for Plaquemines was low, probably due to the very low number of respondents. Plaquemines is a small parish and was greatly affected by Hurricane Katrina; at the time of our interviews, it is likely that few from the parish were available in the area. The second exception is for Orleans Parish: only a little over half our respondents evacuated ahead of Katrina, where the HTF survey indicated that 70 percent were likely to evacuate. Again, sample bias may have caused this disparity.

Both this study and the HTF survey indicated that income was related to (non)evacuation, with lower proportions of the populace with low incomes evacuating. For HTF, the one exception was Plaquemines Parish, which had nearly equal numbers of those with less than $25,000 income and those with higher incomes evacuating (83 percent and 85 percent, respectively). Plaquemines is clearly vulnerable to storm surge, and those with low incomes in this more rural area evidently take evacuation warnings seriously (and the rural poor may be more likely than the urban poor to have adequate transportation).

Forty-nine percent of the respondents in this study reported having had hurricane evacuation plans in the months ahead of Katrina. This corresponds well with the HTF study, where 41 to 62 percent of respondents from the various parishes

TABLE 11: Logistic regression model results for noncompliance with evacuation orders

Explanatory Variable	Coefficient	Odds Ratio
Gender		
Female		1.00
Male	0.747**	2.11
Race		
African American		1.00
Others	-1.292**	0.28
Education		
Up to high school graduate		1.00
Beyond high school graduate	-0.877**	0.42
Trust in television sources of information		
High		1.00
Low and medium	1.191*	3.29
Trust in local government		
High		1.00
Low and medium	0.485	1.62
Trust in state government		
High		1.00
Low and medium	0.386	1.47
Trust in federal government		
High		1.00
Low and medium	-0.315	0.73
Intercept	-0.621**	

-2 Log-Likelihood = 57.681 (df = 7), significance < 0.0001
**Significant at 0.01 level
*Significant at 0.05 level

reported having a definite evacuation plan. (The 62 percent was the definite high, and was for Plaquemines—clearly the most vulnerable parish.)

According to Howell and Bonner (2005), "[I]n every parish, the TV meteorologists are the most important source of information." Our research likewise indicates a high level of dependence on television news sources (with respondents particularly mentioning local meteorologists and The Weather Channel). However, the

HTF study also indicated that "the meteorologists are utilized more as sources of *information* about the category and projected path of the storm, rather than *advice about what to do*. Residents rely on their own perceptions of risk, past experiences, public officials, family, and friends in making an evacuation decision."

In our questioning, a variety of potential information sources were presented, with respondents being asked specifically to tell "how important each was, relating to your decision whether or not to evacuate for Katrina." Responses were recorded on a Likert scale, from 1, extremely important, to 5, not at all important. Our respondents actually indicated that local television (with an average response of 1.6) surpassed family members (average 1.9) as a basis for deciding what to do. Radio stations were third in importance (average response 2.4), and local government officials and friends tied for fourth (2.5). Of lesser importance were state officials, newspapers, and the Internet, in that order. Also notable is the fact that for local television, the standard deviation of responses was less than 1.0, whereas for the Internet it was 1.5. Apparently, and unsurprisingly given access patterns, there is a much wider variability in the use of Internet sources of information than for television.

Logistic regression was employed to identify the important determinants of (non)compliance with evacuation orders in the study area. Seven independent variables were included (see Table 11). Income was not included because of its high correlation with both race and education. A number of variables (e.g., disabled persons in household, pet ownership) were not included because they did not show strong association with evacuation in the bivariate analyses. Since the sample size considered in this study is not large for logistic regression techniques, no interaction term is considered, and each variable is grouped into two categories. (The reference category for each variable is indicated in Table 11 by odds ratios of 1.00.) The seven-variable regression model is highly significant ($p<0.0001$).

Four of the seven independent variables (gender, race, education, and level of trust in television sources of information) are statistically significant. The odds ratios of the variables can be interpreted (with the sign of the relationship) as indicating the relative odds of *not* evacuating for the second category as compared to the reference category: the odds of not evacuating are 2.11 times higher for males than for females. Similarly, the odds of not evacuating for nonblacks are 0.28 times lower compared to African Americans in the sample. Most of the variables included in the model are related in the direction that would be expected given other research in hazards response. The exception is trust in federal government: the negative sign indicates that those with low to medium trust in the federal government were more likely to have evacuated, as compared with those who expressed high trust in the federal government. This may very well reflect

greater mistrust in hindsight, based on the experiences of evacuees, rather than mistrust prior to evacuation.

As well as corresponding with the bivariate analyses, these findings are consistent with findings of Elliot and Pais (2006) and Lavelle and Feagin (2006). These authors concluded that race and class were equally influential for compliance with evacuation orders issued prior to the landfall of Hurricane Katrina. In Southeast Louisiana, particularly New Orleans, it is difficult to separate race and class because the poverty rate is higher among African Americans than other races; as noted, income was not included in the logistic regression because of its high correlation with race. There is, however, an ongoing debate regarding whether evacuation of Hurricane Katrina was a race or class issue (Lavelle and Feagin 2006). Reed (2005) claims that class—based on income, wealth, and access to material resources—was a better predictor than race for those who evacuated before the hurricane. In reality, race and class are deeply intertwined in southeastern Louisiana.

Discussion

Race, income, and education all were related to our sample's evacuation rates ahead of Hurricane Katrina, as would be the normal expectation. These variables are most likely intercorrelated, however, and further study should attempt to determine whether any of these is more important than the others. Another factor that should be considered is not just these characteristics of residents, but the spatial patterns of residence for those not evacuating versus those evacuating. Low socioeconomic status likely is related to concentration of the most vulnerable people in the most vulnerable places. Mitigating hazard vulnerability in places with high physical *and* high social vulnerability, and provision of specific evacuation aid for those in more hazardous locations would be most helpful (in combination with increased trust in information sources, including government authorities).

Women are more likely to evacuate ahead of a warned-of hazard, according to other research, and this pattern was evident with Katrina. The gendered pattern of evacuation generally matches prior hazards research and expectations, as do others of the results described above. The implication here, though, is that when there is an evacuation warning for a known hazard occurrence like a specific hurricane, women should perhaps be considered as *less* vulnerable than men, at least where protection of life and physical health is concerned. Men tend to maintain a presence "in harm's way" to a much greater extent than women. They may be trying to protect property, or they may have a much greater tendency to underestimate an oncoming hazard.

Although a lack of transportation often is cited as reducing evacuation rates, by both researchers and respondents, a fair number of late evacuees in our sample either had a car or had access to transportation. At least one respondent commented that, although she didn't think she had transportation for evacuation ahead of Katrina, she would find transportation in the event of another strong storm. This may indicate that not only would some of the nonevacuees leave if provided with public transportation, but some would push themselves to work harder to find transportation after going through a major disaster.

Unlike the implication of prior evacuation work, having experienced damage from a hazard (here, hurricane) in the past did not appear to cause a greater likelihood of evacuation. Our interviews did not indicate a significant relationship between having a home damaged in a previous hurricane with evacuation. Indeed, a new term—the "Camille Effect"—recently has been used to describe the tendency of many Gulf residents to forego evacuation, believing that nothing could be worse than Hurricane Camille and, if they survived it, they would do fine with Katrina. There thus appear to be polar possibilities for people who have experienced hurricane damage in the past: some may feel more threatened, and leave, when strong storms approach; others may feel that, having done well in past storms, a new one is unlikely to be a major problem.

Another possible polar decision involves households with disabled persons. Presence of disabled persons in the household did not exhibit a significant statistical relationship with evacuation. In this case, respondents may have been split between those who felt they had to remove disabled family members for their safety, and those who felt that evacuation would place loved ones in greater danger. In addition, there may have been differences depending on the level of disability. It may be that there were evacuation differences between households with members having relatively minor disabilities and those having much more serious disabilities.

Although our findings and the HTF study had good correspondence regarding the proportions of respondents with hurricane evacuation plans, the numbers of both indicate that a much higher proportion of the population probably should have such plans, particularly given that nonevacuees showed a greater tendency to have no plan. Having an evacuation plan in place is likely to promote action by residents when needed, as has been noted by other researchers. However, there is a circular relationship here, as those who already are more likely to perceive risk and evacuate are the ones most likely to have a plan (Howell and Bonner 2005).

Residents who *never* evacuated for Katrina most likely should be seen as behaving appropriately. In addition to evacuation of residents who may be vulnerable to a

hurricane and its aftermath, due to location, economic, or physical circumstances, efficient emergency management also calls for nonevacuation of those who do not stand to be harmed (other than perhaps minor property damage). Chances are that those residents that never evacuated were highly aware of their own situations and the likelihood that they would have little trouble weathering the storm. However, in our sample those who never evacuated were outnumbered by those who did not evacuate ahead of Katrina, but were forced to evacuate due to the storm's aftermath. These are the individuals who should receive the most attention regarding improved understanding of factors that kept them from leaving until conditions, often life-threatening, forced them out. Mitigation of these factors, whether this means improving information (and trust) over the long term, or improving planning for provision of transportation, shelter, and food for the next evacuation, is critical for protection of people in hazard-prone areas.

Pet ownership often is considered to affect evacuation, with many pet owners unwilling to leave their pets behind or place them in animal boarding facilities, but pet ownership was not indicated as a statistically significant factor in overall decisions among those we interviewed. Many were able to take their pets when they evacuated—particularly those who either evacuated to homes of family members or who were able to find motel accommodations that allowed pets. Some left pets behind; this is not to say that it was an easy choice for all involved—some interviewees were clearly troubled by having had pets that perished in floodwaters or that could not be located. For *some* of the late evacuators, pet ownership may have played a role in their decision making; this, however, was not indicated by the statistical findings.

Although the presence of "school age children" (Mileti 1999) normally is expected to increase evacuation rates, in our sample this relationship was not found to be strongly related to Katrina evacuation. At the 0.10 significance level, however, the presence of children was significant, perhaps reflecting a somewhat less strong relationship to evacuation in this specific situation than researchers generally expect.

Conclusions

In sum, a wide variety of factors have been implicated in the literature regarding hazard response and evacuation. Building upon the combination of social factors and prior research, our goal was to explore the experience in southeastern Louisiana regarding variations in evacuation for Hurricane Katrina. As stated by Cutter (2006), we need better understanding of the circumstances that place people at risk and conditions that affect their ability to respond. Evacuation can be seen as one means of increasing "resistance" to hazards (see Cutter et al. 2006).

Conditions left people in place for dangerous storm strike. Reasons easily can vary from person to person, including a lack of real understanding of the risk (whether from insufficient exposure to information or low levels of trust in conveyers of information), a lack of transportation (or perceived lack of options), knowledge of options, familial situations, and lack of money.

Many of our findings correspond well with the general hazards/evacuation literature, but some do not. Although the sample in this research was not random and not scientifically representative of the pre-Katrina population, the locales chosen did yield good distributions of interviewees regarding income, age, race, and education. As a stand-alone study, this research has limited application to emergency preparedness planning due to sampling bias, but should be regarded as supporting, in this region, many of the points we know from prior studies: race, education, gender, and income or class play important roles in the actions of residents in the face of a significant hazard. Additionally, findings indicate that there are particular areas that should receive more attention with respect to research and future preparedness, including questions of the role of trust, information sources, and variability of responses with respect to vulnerable populations (presence of children, the handicapped, the aged), and the sometimes controversial role of pets in evacuation decision making. Further work with interview data should include spatial analysis of evacuator/nonevacuator characteristics. Increasing understanding of groups who do not evacuate, and the factors related to nonresponse are of particular importance. While we can say that emergency managers (along with social service providers and city planners) should be addressing these factors to mitigate them and reduce nonresponse, it appears that there still is need for additional research.

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Covering the News "come hell and high water": Journalists in a Disaster

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Abstract

Hurricane Katrina presents a unique opportunity to examine the impact of trauma on journalists covering a story when they were also victims. We videotaped in-depth interviews in New Orleans in mid-October, 2005—six weeks after Katrina devastated the city and only days after officials allowed citizens to return—of journalists who worked for newspaper, radio, and television outlets as photographers, videographers, producers, news managers, reporters, or anchors. We asked readers, listeners, and viewers we met in the city to assess the quality of the media coverage in terms of accuracy, usefulness, availability, and objectivity. Results show that radio proved invaluable to residents who were fleeing the city in cars. The major newspaper, however, was suddenly dependent solely upon its website rather than its printed product. Audience members were grateful for information yet critical of many aspects of media coverage. Journalists typically said they felt closer to their colleagues and to the city than ever before, but there were, and remain, many emotional consequences to covering the story.

Keywords: trauma, media, journalism, stress reactions, disaster

In October 2005, six weeks after Hurricane Katrina struck, I traveled to New Orleans on a National Science Foundation grant to interview both journalists who had covered the story and residents of the city they were writing about.

My research is in the area of media and trauma, and I examine the professional codes and practices of media members engaged in covering disasters, whether manmade or natural. I am interested in the methods and formulas journalists use in writing about and photographing people in crisis. I write about the impact this work has on journalists, on their readers and viewers, and on the subjects of their interviews—anonymous citizens who suddenly appear in the national and international spotlight that major catastrophes can trigger.

With the ultimate goal of creating a documentary, I have collected 15 hours of video images and in-depth interviews with reporters, photographers, editors, producers, writers, and news managers who were working in New Orleans for local or national radio, television, and print news organizations. Additional interviews were conducted with a variety of returning residents, volunteers, relief workers, and government officials, including Mayor C. Ray Nagin. They all had been heavy consumers of the Katrina coverage.

The interviews with journalists offer a window into the professional, ethical, and emotional motivations of media personnel working under extreme circumstances. How they approach, assess, and evaluate their own work sheds light on the ways news culture itself works to shape story selection and framing, placement, emphasis, illustrations, and other imagery. Interviews with audience members demonstrate again the long established principle that the same message may be read quite differently by people of different races, genders, age groups, and social classes.

Serving the Public

When reflecting on their own work, journalists may be expected to describe their roles, responsibilities, and overall performance in ways that reflect positively on their profession. This was the case in an earlier project of mine that focused on U.S. journalists who covered the Columbine High School shootings. Columbine journalists noted the importance of providing immediate information as the story was unfolding. For example, Patti Dennis (1999), News Director at KUSA-TV in Denver, said: "Being a parent, I put myself in that role. And I live in that community so it was very personal for me. I thought, those parents need information and they need it fast. As much as we could give them. That was the most important thing in those first hours, helping 1,800 parents find 1,800 kids." Reflecting on their later work, journalists frequently noted their responsibility as the watchdogs of school officials, whom they repeatedly pressed for explanations of how the shootings could have happened and why they had not been prevented.

In both Columbine and Katrina, the media came under intense criticism for some of its reporting. Nonetheless, New Orleans journalists who covered the devasta-

tion often remarked on the media's importance to the citizens of the city and its role—not as watchdog—but as messenger to Washington and the world. According to Ron Brooks (2005), a news manager for Clear Channel Radio:

> *People that really have broadcasting in their blood, if it's truly a part of their life, they know that no matter what anybody thinks about the commercialism of broadcasting, we are really here to serve our community, to serve the public, and certainly not to put ourselves in the same position as police or fire departments, and those kind of lifesaving organizations. But in a time of crisis, we look at our responsibility and our duty very similarly.*

Stacia Deshishku (2005) is stationed in the CNN Dallas bureau. A few days before Katrina hit, she was dispatched to New Orleans to oversee more than 100 CNN employees. The network's supervising producer, she recalled that as the dimensions of the devastation emerged "the overall feeling for everyone was 'we need to get this out, nobody knows what's going on.'" While local media focused on the citizens of the city, CNN had a different audience to serve. "This wasn't going to be for the local viewers to find out how their area of town had fared. This was going to be information that was going to go worldwide" (Deshishku 2005). Nonetheless, Deshishku regarded her work with an equal sense of mission to serve the public:

> *We were desperate to get these pictures out because as Americans, we couldn't believe that this could happen in America. And it was a frantic feeling of "how are we going to get this out?" How are we going to get it out quickly enough, how do we get it out in a way that respects the people here, that respects the situation, that respects that there are privacy issues. But people need to know what's going on, and at CNN we feel a global responsibility; it isn't just to the local population people who want to know what's going on.*

Journalists repeatedly noted that the citizens of the city were grateful for the media's interest and coverage—"for the most part [they] were incredibly happy to see us, especially people at the Dome, the Convention Center—they were people who wanted to tell their stories, wanted to plea for help, and saw us as an avenue to do so" (Thevenot 2005a). Members of the local media felt they were especially welcomed and well received, even during the worst moments of crisis. John McCusker (2005), photographer for the New Orleans *Times-Picayune* stated:

> *We said that we were from the* Times-Picayune *and we wanted to ask them some questions and in the middle of all this confusion, they looked up and there was this glance of reassurance in their eye, us telling them that our paper was still here and we were still doing our job and we were trying to get the story out and there*

> *was a real connection there. And it meant a lot to them and it meant a lot to me to know that we were going to get the story out and let the people out there know the situation they were in, and hopefully the story would get out and the cavalry would be on its way.*

Despite criticism on a number of counts, the news media coverage of Hurricane Katrina has been hailed as a high point in contemporary U.S. journalism. The New Orleans *Times-Picayune* received two Pulitzers for its newspaper coverage while NBC Nightly News with Brian Williams, CNN, and local stations WWL-TV in New Orleans and WLOX-TV in Biloxi were all awarded Peabodys. As expressed by CNN's Stacia Deshishku, the Katrina stories were not only about "the grief of what the people went through, but there were also amazing stories of survival." Deshishku went on to describe the reaction of people to their programming as phenomenal. Her network, she said, was "committed to being here and we weren't committed to being here in a small way." People saw that and appreciated it (Deshishku 2005).

Importance of Radio

When the storm hit the city, Clear Channel lost its radio transmitter but had functioning studios in Baton Rouge. Entercom lost its studios but had a functioning transmitter. Managers from both radio groups decided to pool those vital resources. They agreed on a 24/7 news-talk format normally carried only on WWL Radio. News-talk would be simulcast on all of the stations in both of the radio groups, a first-of-its-kind joint venture on every level from engineering to production.

Clear Channel's Ron Brooks said the broadcasting done by United Radio saved lives. He was on the air when Mayor C. Ray Nagin called in with an impassioned plea for help, "one of the most powerful and frightening things that I've ever heard in my whole life." That phone call, Brooks said, was an obvious turning point for the city:

> *[His] comments were repeated on every cable TV news program, on every network TV news program, every radio network across the world. . . . it pointed out that there was a tremendous need that was not being addressed—that the government, whether it be state, federal, military, whatever—forces were not coming in to help these people. People were trapped. There were people injured, sick, dying; it was a real crisis and it was not being addressed and there was that phone call to United Radio that finally got things lit up and moving and some relief into the city.*

Particularly during the early first hours of the disaster, radio reporting was vital because it provided eyewitness accounts, not by reporting staff but by citizens from every part of the metro area:

> *We were there getting phone calls from people describing where the flooding was occurring. So we could tell people that Lakeview is flooding, the Lower Ninth Ward is flooding, Chowmet is flooding, which we certainly hoped saved some lives. People heard something that there was no other way to hear, so that they could make preparations, so that they could get on their roof or get out of their home (Brooks 2005).*

Callers were put on the air in an effort to help reunite families who were in separate cars and got split up on the highways leaving town. Six weeks after Katrina hit, United Radio was still on the air,

> *providing people with answers to their FEMA questions, their Red Cross questions, still trying to connect families, trying to help people find housing, help people find jobs. It's the most unique thing that I've done in my 25 years in radio, and probably the most important that I'll ever do (Brooks 2005).*

The importance of radio was noted by many interviewees, and Brooks confirmed that "virtually every caller at some point says 'thank you for what you're doing, it's been the only way for us to find out what's going on.'"

The Importance of the Internet

At the New Orleans *Times-Picayune*, most of the reporting staff left the city when the newspaper's offices started to flood at the rate of a foot an hour. They were evacuated in delivery trucks and eventually regrouped in Baton Rouge. A small group stayed in the city. Editorial writer Dante Ramos (2005) was one of them:

> *Our little team in New Orleans consisted of a photographer, some reporters from the city desk, the art critic, the music critic, the deputy editorial page editor, and the person who was sort of coordinating everything was the sports editor. I think it was good that we were flexible, were nimble enough and able for people just to take the initiative and do things that they thought were important to do.*

Reporter Brian Thevenot (2005a), who also stayed, said they "wanted to be part of the biggest story in their career and, there was an immense feeling of public service involved, especially in a hometown paper. We knew this town better than anybody else did, better than any journalists who would come in from out of town, and we didn't feel like we could just bail on the story." By that time, it had become

clear that many people who worked at the paper were also victims of the storm. "We already knew that we had lost everything we owned, but we knew that the people who depended on this newspaper were a fiercely loyal group of readers and we couldn't abandon them" (McCusker 2005).

The *Times-Picayune* crew realized they faced enormous challenges. They had left their offices without notebooks, pens, or laptops. Their transportation consisted of a newspaper delivery truck, a car, two bicycles, and a kayak, which the sports editor paddled back to the abandoned newspaper building so he could retrieve supplies.

The newspaper's website was the only way to supply readers with up-to-date information; in addition, the presses were down for three days. "All of our readers were spread out all over the country in some type of diaspora and they couldn't get the news they needed from the *Times-Picayune*, and we couldn't have gotten it to them printed, so the web played an essential role in making sure that these people stayed informed" (McCusker 2005). Traffic to their website (nola.com) "exploded to more than 30 million page views a day" (Thevenot 2005b, 31).

Reporters who stayed in the city suddenly had to adjust to a new filing routine. As Ramos (2005) described it:

> *You're kind of feeding bits and pieces. Somehow they kind of magically end up on line, and it's a good thing that we had that available. Otherwise there was a lot of information that was coming out of New Orleans, and the people I was with were writing some terrific stuff, that would never have seen the light of day. . . . we would have loved to have a printed product, but I don't see how we would have gotten it around a city that was only navigable by boat.*

But filing for the online paper was not an easy task. Thevenot reported from Iraq with far less difficulty: "This was more chaotic, a lot tougher logistically, just to write stories and get them in. In Baghdad, I had a satellite modem, and I could e-mail back and forth with people, and instant message immediately across the world, file stories, no problem. This was just a logistical nightmare trying to get all this stuff into the paper every day." For the most part, cell phones did not work, although text messaging was used widely. Landlines were reliable most of the time. Keeping battery-dependent digital cameras and computers charged became a problem. As John McCusker noted, "after a while, those start to run down, we had to go find somebody with a generator and charge them up or we'd use AC power converters in our cars and we would charge them up that way."

Times-Picayune staffers said the paper's view of its website was profoundly changed by their experiences during Katrina. So was the concept of planning for a worst-case scenario. Said Thevenot: "It's definitely true that there was no master

plan to relocate the entire newspaper. I mean we were in a pretty hurricane-proof building, in a pretty high part of New Orleans and it was pretty shocking for us to see water four feet high around the building."

The Importance of Planning

News organizations on the Gulf Coast have experience with hurricane coverage, but the level of planning for Katrina varied widely. New Orleans television station WWL-TV, the only local station that never went off the air, received a Peabody Award for its preparations. "From prestorm advisories to investigative reports on why the levees failed, WWL's coverage of Hurricane Katrina began two days before the storm battered and swamped New Orleans and continued, unbroken, thanks to careful preplanning and dedicated personnel, 99 percent of whom stayed on the job" (Peabody 2006).

The planning for a "doomsday scenario" began with Hurricane George and was honed with Hurricane Ivan, according to Chris Slaughter, assistant news director. It involved splitting the staff into teams and sending teams to different fallback positions, starting with the station's transmitter building across the river, which had been rebuilt to withstand a category 4 hurricane. It's 20 feet off the ground, built of reinforced concrete block, and has a 20,000-gallon diesel tank on site that is also raised 20 feet from the ground. In the event that the city was evacuated, a second fallback position was established at the Manship School of Communications at Louisiana State University:

> *Not only do they have good equipment, they have good instructors, the students impressed us—we had a number of them work here with us as desk assistants and other entry-level positions. . . . I went up there, the news director went up there, the chief engineer went up there. So we covered the news part and the engineering part and we came to a memorandum of understanding with LSU (Slaughter 2005).*

Another agreement was made with Louisiana Public Broadcasting (LPB) in Baton Rouge. The Hyatt Hotel in New Orleans was yet another position they had covered. When a storm was six hours from landfall, the plan called for remaining staff to go there. The high-rise hotel was also the city's fallback position, so WWL journalists would have access to city leaders. On Saturday before Katrina hit, the plan went into operation, Slaughter recalls,

> *We evacuated here and we handed off the broadcast to the LSU operation, so it was seamless. We were putting up a signal from LSU by satellite. We were broadcasting over both analog and digital signal here in New Orleans. One of the things*

> *that we're proudest about is that we maintained a constant stream over our web page. We had an agreement that was worked out quickly with Yahoo. Yahoo has been streaming our signal so it really increased our reach.*

While much of their technology worked, some completely failed.

> *Cell phones were a spectacular, unbelievable, unimaginable failure in this situation. To this day, cell phone service in this city is still terrible, I can pick up my phone and maybe stand a one in three chance of getting out. However, other things unexpectedly stayed up. Text messaging was a lifesaver. Possibly one reason for this cell phone failure was that so much text messaging was going on that the phone calls couldn't get through (Slaughter 2005).*

Enormous amounts of food, water, and fuel were on hand. Coverage was continuous, even station identifications were dropped. Behind the scenes, crews were shifting to all of the fallback locations. Eventually, the bulk of the staff moved to LPB in Baton Rouge, where they remained until early October when the New Orleans facility re-opened for business.

Corporate support from other Belo Corporation stations was also critical. Slaughter noted a surge of assistance in the form of satellite trucks, writers, reporters, producers, and crews. "One thing we did was to mix crews; if a reporter came in from a Dallas station, we would put one of our reporters with one of their photographers, one of our photographers with one of their reporters, that way the person knew their way around town, the local could help the out-of-towner to see the nuances of the story, not only did this give us a better product, but it gave us flexibility that otherwise we wouldn't have had." Corporate human resources people were dispatched to Baton Rouge to secure as much housing as they could find. Slaughter recalls,

> *Their job was to 'get housing, get housing, get housing.' Initially, for example, I stayed in a condo with six other guys. It was an amazing condo and we enjoyed it. It was air conditioned, and that was great, and we all had a place to sleep, but it was all a result of the HR people coming in, focusing on the task, and getting it done, and that was part of the overall plan. We never went off the air—I'm very proud of that—and it was the right thing to do. Two other stations in the market had their difficulties. One of them got flooded very badly, and the other, I can't say very much about them.*

Belo employees from around the country contributed money. "The amount of money that came in was really quite incredible . . . when you're working 80 hours a week, a hundred hours a week, and your house is damaged, and your family is

displaced, this is one of the things that helps you get through, and that's one of these things that I'll always remember about this deal—the unexpected help from other employees and how deep and widespread it was" (Slaughter 2005).

Many people at the station had damaged homes. Many lost everything. In some cases, they could not return to their homes for weeks. In an effort to help with the stress, counselors and psychologists were brought in. Conversations were confidential. "Initially, the adrenaline kept them going for about three or four days, then we would see some people get a little upset" (Slaughter 2005).

WWL-TV Anchor Karen Swenson said the newsroom "was so organized that you didn't have time to think about anything but your job. It was actually a great work environment because things were happening so quickly; as soon as you walked in the door, you were put on the set." Anchors worked shifts of up to 12 hours, on set without a script. Staffers were up for 24 and 36 hours at a time. At one point, the anchors were on the air arguing over which day of the week it was."

Swenson, who lost her home because of the storm, recalls the harrowing weekend before Katrina landed. On Friday night, things did not look too bad, but that changed on Saturday and she realized she had to evacuate her daughter:

> *I just took everything I saw from her crib, from her dresser, and shoved it into a bag, I woke her up, and took her in her pajamas and dropped her off at my sister-in-law's with her insurance card and a note with my number on it "if you need anything else, let me know." Usually, people are back in two or three days, and people have great stories about the hotels they stayed in. I had no idea that it would be weeks before I'd see my daughter. It was two weeks. A terrible two weeks (Swenson 2005).*

Swenson was on the air Saturday night and into the early hours of Sunday morning. She slept at the station and woke up to the news that the storm was a Category 5 heading straight for the city:

> *I was petrified and I just realized that my husband and I hadn't written out a will, so my husband [a New Orleans detective stationed at the Superdome] and I had a very short conversation and that was to figure out who would take care of Catherine. We decided that I would call my parents and say, "if anything should ever happen to us, that you would take care of her." And so I did and that was a tough conversation, but we had to sort of get our ducks in a row before we started in on our jobs; once you're in your job you're pretty focused and it's ok but I think the worst time for me emotionally was before the storm that morning.*

Once she knew her daughter was safe, Swenson was determined to stay in the city. "I felt I had the responsibility to stay here and convey information to people."

Journalists and Trauma

Photographers and reporters are often aware of the emotional toll that reporting on traumatic stories takes. As Roger Simpson and William Cote note in *Covering Violence* (2006), journalists are first responders to tragedies and disasters just as police, fire, and medical workers are. They are also vulnerable to stress reactions, including post traumatic stress disorder (PTSD), a medically recognized diagnosis that increasingly is being made for news workers. Symptoms of PTSD include having flashbacks to the event in question, being emotionally numb to daily events, and having a heightened startle response (Simpson and Cote 2006). For many or most journalists, emotional responses to trauma do not fall into the PTSD category but nonetheless reflect the stress that accompanies bearing witness to suffering and destruction. Many of the journalists we interviewed in New Orleans had experience reporting in Iraq and noted the comparisons:

> *For me, this is worse than Iraq. Because there, the language barrier meant I was always a little bit separate. But I can understand every word people here say to me and it's killing me. Strangers come up to you and beg for water. They want to know where you're staying and if they can stay with you. . . . they want you to put their names in the paper so their loved ones can find out they're alive. And I feel helpless because I can't help them. One person was yelling at a photographer friend of mine the other day, saying he was exploiting people in pain, and he said, "Ma'am, this picture is going to go out to thousands of people and they need to know what you're going through. That's the only way you're going to get the help you need." Is that true? I like to think it is, but I don't know (Pompilio 2005).*

For the most part, out of town journalists had the comfort of knowing that at some point they would leave New Orleans and return home. Local journalists had a harsher reality. Brian Thevenot recalls that each person in his *Times-Picayune* group had a different breaking point and that some reactions were more severe than others. For him, the shattering moment was when he heard his colleague John McCusker talking to his son on the phone:

> *I remember him telling his son that, "You know the house is gone." And then [stops to regain his composure]. Excuse me if I get a little emotional again. But then John said something about "we've still got each other" and you know at that point, I started crying and then I went outside and then I started thinking about all the people who had died and it was an extremely emotional moment. I mean it was one that I could come back pretty quickly from, I think, but it was a*

> *pretty heavy weight to bear at that time, because I had been in the Ninth Ward and St. Bernard's Parish and seen twenty feet of water when it was at its height. I don't think I had thought about anything but doing my job up until that moment (Thevenot 2005a).*

Many local journalists lost their homes or were displaced for weeks. They were separated from family and friends. Early on, McCusker's wife resigned her position at the newspaper and moved out of state so their two small children could be enrolled in school. Having his family two states away has been "gut wrenching" and only added to the pain he felt while on the job. "You're trying to hold it together, because everything you see is awful, every image is worse than the last one that you saw. You get to the point where you say to yourself, 'how much more of this can I handle, how much more of this can I see?'" (McCusker 2005).

The journalists began to realize that their own jobs were in jeopardy—they questioned how a newspaper could carry on without readers and advertisers. If things did get back to normal, what size would the market be? Said Thevenot, "That was an incredible thing to sort of realize that this place that we were working for and trying to keep alive and save might ultimately fold or become a shadow of its former self." McCusker recalled that by the third day, "every few minutes one of us would break down because something would come to us, something that hadn't occurred to us would come to our mind and we would just start sobbing." Adding to the stress was a sense of fear and vulnerability to crimes that were taking place across the city. At one point the *Times-Picayune* staffers, who were all living together in the city, were advised by the police to get guns. "When the police are telling you to arm yourselves, you better listen. We basically just kept them in the house. We didn't carry them in the streets; it was just to protect us overnight in a sort of worst-case scenario" (McCusker 2005).

In order to cope with these stresses, some reporters turned to alcohol. Recalled Thevenot,

> *There was definitely a lot of drinking going on. I did take a couple of shots of Scotch while I was writing a story just to sort of self-medicate . . . But it was extremely long, long adrenaline-filled days, followed by bouts of some drinking at night and sometimes a lot of drinking at night. But when your body is in that mode you don't even feel the alcohol. You're trying to get back to normal, rather than getting drunk, and trying to get to sleep, trying to prepare for the next day and whatever it may bring.*

Six weeks after the storm hit, and the newsroom in New Orleans was open for business once again, journalists had a sense of sorrow mixed with pride and

accomplishment. For many, their newsrooms were no longer simply their places of employment. Many spoke of bonding with colleagues they sometimes had not known or even liked. Many said it was like going through a war together. And almost all, like John McCusker, said it was an experience that would never be forgotten. "I don't know about the other folks, but I have a special feeling about everybody that was there with me. I know what they are, I know what they are capable of, and they will be very special to me always."

Dante Ramos noted that journalists did not suffer in the ways many citizens did. "It's always dangerous for us as journalists to pat ourselves on the back too much. As difficult as this situation was for us, it was a lot more difficult for a lot more people, far more difficult. But having said that, the people I was with in New Orleans, some were some people I knew to some degree, some better than others, and the quality of work that was coming out of that group was amazing."

Audience Reactions and Criticisms

The majority of people in the United States get news and information from television. But not all TV stories have equal impact. In fact, on most days, the audience for television news is relatively small. Viewing patterns make it clear that it takes a major news event (9/11, the Columbine High School shootings, the death of Princess Diana, the Oklahoma City bombing are all examples) to create a dramatic ratings spike and, even then, the effect lasts for only 24 to 48 hours before ratings begin to drop back to more modest levels. Since audiences have many choices, competition for their attention can outweigh other factors in shaping news coverage. In a similar way, the ubiquity of 24/7 cable news additionally pushes television journalism toward action and conflict reporting, that is, toward graphic imagery.

No matter how powerful, television images are never reality. They are constructions of reality made by journalists (themselves products of U.S. social and cultural institutions) who have effective, well-defined ways of creating stories that will have narrative coherence and dramatic power. Visual communication offers a shorthand for complex social realities. To the extent that this shorthand relies on stereotypes, Katrina coverage reinforced existing notions of race and class through its use of visual coding, a topic addressed in the audience interviews.

The contemporary audience is divided among niche markets; rarely do black and white viewers tune in to the same programming. Pro football games are among the few programs that generate a crossover audience. Major news events are another. Whatever distortions were conveyed by the Katrina coverage, a huge national audience of blacks and whites alike consumed them. This was a rare moment when

television was reaching the entire nation. Some respondents felt this opportunity was used to reinforce negative stereotypes.

Vast amounts of time, energy, and money were spent on coverage of Katrina. Journalists describe a real commitment to the story by their news organizations, and heroic efforts by their colleagues to work under grueling conditions. Nonetheless, viewers and readers who were interviewed were quick to point out the inaccuracies and bias in what they saw and read. Of the millions of words, thousands of images, and hundreds of hours of coverage, the lasting impression viewers got of New Orleans and its citizens was negative. As Mayor Nagin said in his interview, the iconic image presented by the media was that "New Orleans is poor and black."

In their interviews, African American audience members described a pattern of coverage that relied on deeply embedded racial stereotypes and, in doing so, extended them to the national and international audience. Many said news coverage depicted blacks as victims and whites as rescuers. David Carr in the *New York Times* on September 5, 2005, described a nonstop media "narrative of feckless victims" being plucked to safety in the Katrina coverage; I would argue that "feckless victims" is an unstated reference to black victims. Indeed, an unpublished study in 2005 of 1,160 photographs printed in the *New York Times*, the *Washington Post*, *USA Today*, and the *Wall Street Journal* between August 25 and September 23, 2005, supports this contention. The study concludes that blacks and whites were portrayed in overwhelmingly opposite ways with African Americans most likely to be shown in passive situations, for example as evacuees, whereas whites were most often shown in such active roles as, for example, soldiers and relief workers. The study also found that when captions referred to looting, African Americans were shown in the accompanying photos 83 percent of the time. In contrast, when survivors were described in captions or were clearly shown guarding their personal property, whites were shown 67 percent of the time.

Ironically, an African American whom I interviewed—who was herself a relief worker—noted this racial coding: "Now when it comes to helping us, you never see blacks, you only see whites, you only see Caucasians. You see maybe a few Hispanics, but no African Americans" (Allen 2005).

Even on-camera reporting done by television journalists (who were mostly white) illustrates this point. Ted Koppel was shown on a boat with relief workers, trying to convince a black woman to leave her flooded home. She refused to go, saying that whites were systematically executing black residents of the city. Koppel convinced her that this was not the case, demonstrating a calm and rational demeanor in the face of this woman's seemingly irrational fear.

In his documentary for the cable outlet HDNet, reporter Greg Dobbs, also white, was reporting from a rescue boat and at the same time helping pluck stranded black residents off of rooftops. As this drama unfolded, the very people who populated his story were rarely interviewed and never named. Instead, Dobbs himself took on the role of nominated spokesperson for the voiceless victims with his words shaping their narrative. As feminist media scholars have long maintained in analyzing gender roles in the news, nominated spokespersons are empowered to make knowledge claims whereas the unnamed speakers (in this case, imperiled black residents) serve chiefly to express emotion and heighten a story's dramatic impact.

Residents who were interviewed noted that blacks who weren't shown as impoverished victims of the storm were often presented as criminals:

> *The media focused on poor people, the uneducated. They played up black crime . . . you hear them say things like, 'A group of black males went down and broke in.' When in actuality, they were of all creeds and colors. Some were saying that they were breaking in for survival. Now I'm not excusing the people that were breaking in, stealing, and robbing other people's homes. I don't uphold doing wrong, but when you catch people that are put out on a limb and trying to survive, we didn't see a problem with that. But in the media, they [didn't give] the whole story—it wasn't just blacks doing it, it was other people too (Lucky 2005).*

The exaggeration of crimes at the Superdome has now been documented by the very news organizations that reported on the Superdome in the first place. Reporters spoke of doing a good job of correcting the record. The New Orleans *Times-Picayune* revisited some of its crime reporting and wrote a major story correcting the record. Following their lead, CNN, the *New York Times*, and the *Los Angeles Times* all ran similar correction pieces.

> *Even in our own pages, sometimes in stories that I wrote, we reported things that we got from other sources and when we went back to look they had turned out not to be true or had not been substantiated. And I think that was a good example of the media taking responsibility and going back to correct the story and I would include the national media in that (Thevenot, 2005a).*

Corrections, however, are never enough to completely call back an original story—they generally are given less airtime on television and less space in newspapers than the original reports they are correcting. And, by the time a correction is made to a major story, viewership and readership have fallen substantially.

White audience members who were interviewed were critical of coverage precisely because it focused on black neighborhoods. As one white, female interviewee saw it, television played "the race card in New Orleans" by focusing so much of its early coverage on the Superdome and Convention Center.

> *I wish they had actually shown more of the city and not just focused on the Superdome so much and the Ninth Ward, because they never talked about Lakeview, and Lakeview flooded and I have a lot of friends who lost homes in Lakeview. They always concentrated on the Ninth Ward. And another thing we got a lot of on the news was the whole racial thing. I personally don't share that view although, you know, I am a Caucasian female. We were getting a lot of stuff, and I guess it's different when you live in the city and you know how things work.*

Another white female respondent made the same point:

> *That was really frustrating because New Orleans is a city that is 67 percent African American, we (whites) are really the minority here, but it was told that it was just a totally racial thing. You know, it shows the Ninth Ward, which is predominantly African American, which is horrible, but there were other parts of the city that were predominantly white, such as Lakeview which was just as affected. You know they lost everything as well. So that was sort of frustrating seeing that.*

Black and white viewers disliked the practice of looping or repeating video from the Superdome. Some images were repeated three times or more each hour. As the case of the 9/11 terror attacks demonstrated, repetition of images is often offensive to viewers. News organizations eventually agreed to limit pictures of the World Trade Center towers falling in response to viewer complaints of being emotionally overwhelmed by the endless replays. And residents of New Orleans described similar concerns about repetition of the most graphic images.

A white, female resident who had been vacationing in Australia when Katrina hit described the coverage as "everything horrible. It was the looting, it was the flooding, it was the Superdome, it was the Convention Center. So we saw all of the negative things that were happening. . . . Luckily we had friends who were emailing us and were saying that 'alright, they're showing some good things here in the States, don't let everything they show you freak you out too much.'"

Nonlocal journalists were criticized for making factual errors because they were unfamiliar with the city. The common practice of "re-purposing" video, sound, and reportorial narratives means that the same images are used multiple times across platforms. For example, reportage gathered for CNN is used on its multiple entities—its domestic channel as well as CNN Headline News, CNN International, CNN.com, and the CNN radio network. One correspondent can feed text,

images, interviews, and a narrative to Atlanta where the material is picked up by all of the CNN properties. Economically, this works to great corporate advantage. But journalistically it assures repetition across channels. As both black and white viewers noted, there was not too much Katrina coverage, there was too much of the same coverage.

Racial Frames in the News

It is widely agreed that the news media perform an agenda-setting function. That generally is described as telling viewers and readers not what to think but what to think about. Certainly in the case of Katrina, news organizations put the disaster at the top of the news agenda. But journalists also carry out a framing function: through their choice of words and images, they actually do play a significant role in telling audiences not only what to think about but how to think about it. When stories are inflected with issues of class, race, and racial stereotyping, it is important to know who the storytellers are. The way journalists create narratives and images is impacted not only by their professional codes but also by their social and cultural perspectives. In stories where race and class are not front and center, these social markers may matter less, but in Katrina race and class were dominant features of the story.

My interviews were carried out with journalists that I contacted before and during my research trip. Wanting to meet as many media professionals as time would permit and working via telephone and e-mail, I requested interviews with staff members and managers at the New Orleans *Times-Picayune*, WWL Radio, Belo Television, as well as CNN, Fox, CBS, and NPR. Interviews were solicited from a variety of news organizations without respect to race. The result was an almost exclusively white population of journalists. More specifically, of 16 journalists interviewed over a six-day period, only one was African American. In looking for explanations of racial stereotyping in both images and texts, the composition of news organizations may be an important and familiar starting point.

In terms of national numbers, newsrooms are more diverse than they were two or three decades ago but African Americans are still an underrepresented group. Despite industry attempts to diversify, employment in broadcast and newspaper newsrooms in the United States continues to be dominated by whites. There are exceptions, of course, but the push by the American Society of Newspaper Editors (ASNE) to reach parity in relation to each community's population, remains well beyond reach.

Nonetheless, one might expect that in New Orleans, a black majority city, African American journalists would have a significant presence in local newsrooms. This

does not turn out to be the case. At the New Orleans *Times-Picayune*, the city's most heavily staffed newsroom and the main daily paper in New Orleans, last year was the peak year for hiring nonwhites, making the newsroom's nonwhite population 17.1 percent of the whole. Beginning in 1992, the first year the *Times-Picayune* responded to the national survey, there was a gradual increase in its nonwhite employees, moving from 9.6 percent in 1992 to 14.8 percent in 1996. Then there was a slight decline in the hiring of nonwhites for a couple of years, before the numbers started to climb again. After reaching 14.9 percent in 2001, there was a slight decrease again in 2003, to 13.9 percent. In 2004 the numbers climbed back to 14.8 percent and went up again last year, to the paper's peak of 17.1 percent.

But even at its peak, the percentage of nonwhite staff is still very low when considering the paper's readership, which last year was 43.6 percent nonwhite. So, while the circulation area for the *Times-Picayune* shows that almost half of the population is nonwhite, the employment figures of nonwhites at the paper make up less than one-fifth of the newsroom.

When considering ASNE's diversity index at the newsroom (the nonwhite percentage of newsroom staff divided by the nonwhite percentage of residents in the circulation area), the *Times-Picayune*'s figure is 39. The medium for all newspapers in the country in the same circulation category (250,001 to 500,000) was 70 last year. Thus, of the 24 papers in the same circulation category, the *Times-Picayune*'s ranking was 23 (Dedman and Doig 2005).

CNN, with headquarters in Atlanta, might also be expected to have a diverse newsroom, but employees described a white male power structure, "CNN at the higher echelons is a mainly male institution. At the middle-to-upper management, there are a significant number of female producers. The weekend seems to be produced entirely by women . . . For the prime-time shows all the executive producers are men. And I do think it makes a difference" (Blake 2005).

Lack of racial diversity among newsroom personnel suggests the potential for a white perspective to control the selection, framing, and presentation of Katrina coverage. Class issues also come into play as does newsroom culture and U.S. culture generally. CNN, for example, had an African American correspondent in New Orleans and considered that a major advantage. But having black talent on the air may not have any fundamental impact on how the story is covered.

> *Just because he is black, it doesn't mean he understands these poor black communities. But there is a credibility issue there. When he stands up and says it, it's harder to call him racist . . . And I think that is the advantage of having a black correspondent—that people who would want to criticize you for your coverage can't use the word "racist" as easily (Blake 2005).*

Another CNN journalist, who is white, described her realization at the Superdome "that these were normal people, these were working people. Somehow, you know we get an image that, oh maybe, that they're less than normal people, but these were working people. These weren't people who didn't work or who were homeless. These were working people, people that had children, they had jobs at the casinos, that worked as waiters, and they were trying to explain to their kids right there on the street what was happening" (Deshishku 2005).

Another white journalist said he realized that he had a particular reaction to seeing four young women from Australia stranded at the Superdome, "I felt guilty about the fact that I felt a lot more concerned about them than I did about the thousands and thousands of people who lived there, that were going to lose their homes, that were going to lose everything. And the days after the storm I was worried about what was going happen to these four white girls. And I had to check myself every time and say, for them, this is not the disaster that it is for everyone else" (Blake 2005).

Conclusions

It is clear that the news media play a critical role in informing the public during times of disasters and crises. The experiences of journalists and news organizations during Hurricane Katrina provide yet another example of the many ways communications can be hampered by unexpected events. In terms of lessons learned, it is clear that news organizations need to have plans in place that might include the stockpiling of food, water, backup power, and fuel sources as well as having fallback positions from which they could operate.

Communication technologies may break down, so having multiple sources of communication provides good insurance. In the case of Katrina, cell phones were not at all useful but conventional phones were, as was text messaging. The Internet will play a vital role, assuming it is operating. For newspapers, websites are the only way to get information out in a timely fashion. But websites additionally give individuals ways of communicating with family, friends, and other community members that were vital during Katrina. Most people listened to the radio, especially as they were evacuating the city and spending hours in their cars. Displaced residents went to the websites of news organizations for information. The newspaper had only its website for the first three days after the printing plant shut down. Community bulletin boards sprang up quickly to answer the more detailed questions that the media were not covering.

Innovation was critical as well, as the joint venture between Clear Channel and Intercom radio demonstrated. This became a time when media corporations had

to consider public service over issues of competition. One local television station was the only media entity that appeared to have a tested plan in place to deal with contingencies such as flooding. In the end, their plan proved highly effective and enabled them to continue broadcasting.

Journalists described both positive and negative reactions to their experiences with the Katrina story. The positives included a sense of bonding and community with their colleagues; a sense of honor for serving the public during a crisis; and a sense of survival, accomplishment, and triumph. The negatives included dealing with the inevitable letdown when the story started to diminish in intensity; resentment over those who stayed in the city and those who left; resentment that media organizations failed to provide more counseling and support during a time of tremendous stress and loss; and fear of the unknown as the city's economic future became quite unclear.

As the *Times-Picayune* newspaper staff prepared to evacuate to Baton Rouge, a core group of one editor (from Sports), three reporters, and one photographer chose to stay in the city and cover the story firsthand. Their leadership has been widely heralded, but the newsroom now faces a number of controversies around who stayed, who left, and why.

Audience interviewees were displeased with the repetition of the same images; some said the national media did not know the city and made mistakes; some (whites) said the national media played the race card, some (blacks) said only whites were shown as rescuers while blacks were shown as victims. Mayor Nagin said the media showed the city to be only poor and black and this was not a true depiction of New Orleans.

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Impacts of Hurricane Katrina on Mississippi State University Students

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Abstract

Hurricanes have affected university and college campuses with increasing frequency over the past decade, yet little research examines impacts and disaster-related experiences of students in the aftermath of a regionally catastrophic hurricane. This chapter examines selected findings of a study of Mississippi State University students impacted by Hurricane Katrina. Utilizing data gathered from a web-based survey (N = 3,140) administered during the recovery and mitigation period following the disaster, we analyze disaster experiences, impacts, responses, and institutional needs of a sample of students who experienced both primary and secondary threats from this historic storm event. We found that differential impacts of the disaster were largely a function of student's interpersonal ties to the evacuation events. Selective differential impacts were also observed for race, gender, and student status. We suggest that future university disaster response and resilience can be enhanced by providing increased social support and counseling services to college students who have experienced mental and physical trauma.

Keywords: Hurricane Katrina, disasters, university students, psychological stress, academic performance

On August 29, 2005, Hurricane Katrina struck the Louisiana / Mississippi Gulf Coast as a Category 3 storm, devastating the city of New Orleans, destroying much of coastal Mississippi, and significantly damaging many towns and counties hundreds of miles inland. In the wake of Katrina's massive winds, tidal surges, and levee failures, regional colleges and universities were particularly impacted, with at least 30 campuses across southern Louisiana, Mississippi, and Alabama sustaining varying degrees of physical damage to their buildings, infrastructures, and normal communication systems (Chronicle of Higher Education 2005). Over 90,000 students (as well as administrators, faculty, and staff) were forced to evacuate their respective institutions and residences, resulting in cancellation of scheduled classes ranging from a few days to an entire academic year. Attempting to manage the crisis from emergency offices located hundreds of miles from campus, some university administrators struggled to communicate with their displaced campus communities from remote websites, as well as to deal with immediate economic losses due to structural repairs, payroll outlays, and diminished tuition funds (Cass 2005; Ferrell and Hoover 2005). Uprooted from their campuses, programs of study, friends, and jobs, tens of thousands of Gulf Coast college students relocated to over a thousand new

universities across the United States to enroll in fall classes (Hebert 2005; Lipka 2005; Ladd, Marszalek, and Gill 2006; Ladd, Gill, and Marszalek forthcoming).

Hurricanes have long been among the most destructive natural disasters that harm human populations, especially in coastal areas, and both their numbers and intensity have increased significantly in recent years (Noji 1997; Associated Press 2005b). Given their potential to generate traumatic physical and psychosocial impacts, including those associated with evacuation and relocation, disaster research on hurricanes has generated an extensive body of social science knowledge (see e.g., Raphael 1986; Waugh 1990; Baker 1991; Gladwin and Peacock 1997; Mittler 1997; Dow and Cutter 1998; Howell 1998; Adeola 1999; Edwards 1999; Fischer 1999; Dow and Cutter 2000, 2002; Drabek 2000; Whitehead et al. 2000; Dash and Morrow 2001; Van Willigen 2001; Sattler et al. 2002; Lindell and Prater 2003; Franke and Simpson 2004; Howell and Bonner 2005; Wolshon et al. 2005). Despite the fact that hurricanes (and other disasters) have affected university and college campuses with greater frequency over the past decade, only a few studies have examined impacts and disaster-related experiences of college students in the aftermath of a regionally catastrophic hurricane (Pickens et al. 1995; Gutierrez, Hollister, and Beninati 2005; Van Willigen et al. 2005). Such hazards can result in death and injury to students, create significant financial losses for universities, and disrupt institutional teaching, research, and service missions (Federal Emergency Management Agency [FEMA] 2003). The hardest hit colleges and universities of the Gulf Coast, for example, initially incurred at least $1.4 billion in physical losses from hurricanes Katrina and Rita, in addition to another $221 million in lost tuition revenue and salaries (Mangan 2005).

This chapter presents findings from a study of Mississippi State University (MSU) college students affected by Hurricane Katrina. Utilizing data gathered from a web-based survey administered during the initial recovery and mitigation period following the disaster, we analyze disaster experiences, impacts, responses, and institutional needs of MSU students who experienced both primary and secondary threats from this historic storm event.

Research Literature

Tropical storms and hurricanes have become increasingly common threats along the southeastern Atlantic Coast and Gulf Coast of the United States over the past decade (Waugh 1990; Associated Press 2005b). In particular, 2005 went down in history as the busiest hurricane season on record, registering some 27 named storms and 13 hurricanes, three of which entered the Gulf of Mexico with Category 5 winds (Associated Press 2005a). The first of these three storms, Hurricane Katrina, became the largest hurricane disaster in U.S. history, generating over 1,800 deaths,

more than one million displaced residents, 250,000 homes destroyed or rendered uninhabitable, and potentially $200 billion in estimated damages (Brinkley 2006). Physical recovery plans for much of the devastated Gulf Coast region are predicted to take at least a decade. Likewise, preliminary assessments suggest a possibility for long-term levels of post traumatic stress, anxiety, and depression among some Katrina survivors (Connolly 2005; Thomas 2005).

Research on physical and psychosocial impacts of hurricanes has carved out a relatively distinctive niche within the larger scholarship on natural disasters (see Noji 1997; Norris 2002; Lindell and Prater 2003; Norris 2005). Much of this research revolves around issues such as hurricane preparedness and evacuation patterns (Baker 1991; Faupel and Styles 1993; Gladwin and Peacock 1997; Dow and Cutter 1998, 2000; Drabek 2000; Whitehead et al. 2000; Dash and Morrow 2001; Bateman and Edwards 2002; FEMA 2003; Zhang, Prater, and Lindell 2004; Howell and Bonner 2005; Lindell, Lu, and Prater 2005), transportation policies and practices (Dow and Cutter 2002; Wolshon et al. 2005), emergency management and societal response (Drabek 1986; Mittler 1997; Fischer 1999; Tierney, Lindell, and Perry 2001; Franke and Simpson 2004), and post-hurricane burnout and relocation (Moore and Moore 1996; Riad and Norris 1996). Other studies have empirically addressed impacts of hurricanes on human health, psychological stress, and social equity issues (Thompson, Norris, and Hanacek 1993; David et al. 1996; Adeola 1999; Edwards 1999; Norris et al. 1999; Van Willigen 2001; Perilla, Norris, and Lavizzo 2002; Sattler et al. 2002). One such study conducted after Hurricane Andrew, a disaster similar to Katrina, found new onset of psychiatric disorders in almost half the sample and about one-third were diagnosed with post traumatic stress disorder (PTSD) (David et al. 1996). Another study of Hurricane Andrew survivors revealed that many experienced major levels of depression up to two years after the disaster (Norris et al. 1999).

Despite the increasing impacts of hurricanes on university campuses (FEMA 2003), little research examines how hurricanes affect the lives and education of college students (Pickens et al. 1995; Gutierrez, Hollister, and Beninati 2005; Van Willigen et al. 2005). The few studies that have been conducted suggest that hurricanes not only produce significant levels of psychosocial stress for college students, but that such trauma is a function of their demographic characteristics, storm location, physical damage, resource loss, evacuation and relocation anxiety, social support, educational impacts, and other postdisaster recovery problems (see also Riad and Norris 1996; Bateman and Edwards 2002; Sattler et al. 2002; Zhang, Prater, and Lindell 2004). For example, in their study of impacts of Hurricane Andrew on students in southern Florida, Pickens et al. (1995) found that students who experienced the most severe impact damage from the storm, including damage to their residences, reported high levels of stress, anxiety, and depressive symptoms. Examining

impacts of Hurricanes Charley and Frances on students in Central Florida, Gutierrez, Hollister, and Beninati (2005) found significant levels of stress and economic loss among students, with females reporting higher levels of stress than males. In addition, students overwhelmingly reported that their stress levels were reduced by having professors who instituted more flexible course requirements to help them cope with the aftermath. In another study comparing differential impacts of Hurricane Floyd on students and community residents in Greenville, NC, Van Willigen et al. (2005) found that students were less detrimentally affected than community residents and enjoyed greater levels of recovery assistance. Moreover, race, gender, and parenthood status had differential effects on both groups. They suggest that students, by virtue of their socioeconomic resources and social roles, occupy a unique position within university communities that buffers them from many direct impacts of natural hazards.

Research Focus and Questions

In the weeks following Hurricane Katrina, an interdisciplinary consortium of researchers from the Social Science Research Center (SSRC) at MSU, as well as displaced faculty from Loyola University New Orleans, Xavier University of Louisiana, and the University of New Orleans, formed to study impacts of this disaster on college students from MSU and the wider Gulf Coast region.

Starkville, Mississippi, home of MSU, was in the direct path of tropical storm winds that roared through the state after Katrina made landfall. The area experienced sustained winds of 50 miles per hour with recorded gusts up to 76 miles per hour and almost six inches of rain in a 12-hour period (National Weather Service 2005). Although there were no serious injuries, the area experienced power outages, fallen trees, minor building damages, local flooding, and blocked roads (Faulkner 2005; Ward 2005). On the MSU campus, classes were canceled from midmorning Monday until Wednesday; some buildings were damaged, power lines were down, and trees blocked many streets (Patterson 2005). Indeed, area storm damage was severe enough to place the county in the northern periphery of the declared disaster zone in Mississippi.

More importantly, thousands of MSU students were personally connected to events surrounding Hurricane Katrina by virtue of having grown up on or near the Gulf Coast and many had immediate family, relatives, and friends who lived along coastal areas heavily impacted, if not destroyed, by the disaster. Given local power outages, telecommunication problems, and blocked roads, many students were also unable to contact their families and friends in the immediate aftermath of the storm. Moreover, some MSU students were visiting family and friends in the coastal region the weekend before Katrina made landfall and thus found

themselves forced to join the larger exodus of displaced students and residents fleeing the gulf (see Fee et al. 2006; Ladd, Gill, and Marszalek forthcoming).

Consequently, our decision to employ a web-based survey to examine impacts of Katrina on Mississippi State University students provided a unique opportunity to quickly gather comparative data on those who had both *direct* and *indirect* ties to this historic disaster. On the one hand, few students in our study fit the category that Dudasik (1980) describes as *event victims* (those persons who were directly subjected to the suffering and hardship of the disaster itself). On the other hand, our sample did overwhelmingly consist of students who were either *contact victims* (those who were affected either directly or indirectly by the consequences of the disaster) or *peripheral victims* (those who had strong ties to the disaster through family and friends), as well as those who had no interpersonal connections to the storm events.

To assess differential impacts of this disaster on MSU students, our study was guided by the following general research questions:

- What were the storm experiences of students and/or their family members and friends and what physical and personal losses did they incur?
- How did the disaster affect students' psychosocial and mental health?
- How did this disaster affect educational performance for the fall 2005 semester?
- What existing university services did students utilize to help them cope?

Research Methods

Survey Instrument

We developed a 143-item web-based survey to investigate how Hurricane Katrina affected MSU students. Composed of 138 structured and 5 unstructured items, our survey covered individual storm experiences, satisfaction with and trust in various government agencies, social service organizations, and university officials with regard to disaster response and relief efforts, and use of various campus services during and immediately following the disaster. In addition, two standardized normative measures of mental health were included: 1) the General Health Questionnaire (GHQ), a measure of psychiatric distress (Goldberg 1972) and 2) the Impact of Event Scale (IES), a measure of post traumatic stress disorder (PTSD) symptoms (Horowitz 1974; Horowitz, Wilner, and Alvarez 1979).

Design and Procedure

An e-mail soliciting voluntary participation in the web-based survey was sent to each individual from the target population of all students enrolled in MSU at the

beginning of the fall 2005 semester (N = 15,889). This e-mail included a statement of informed consent, a description of the research procedures, and an explanation of the procedures used to protect the participant's privacy. If students chose to participate in the study, they could access the survey through a link embedded in the e-mail. Accessing the survey presupposed that students read and understood the statement of informed consent and were willing to participate.

The survey was widely publicized through the campus newspaper and the campus radio station. Additionally, the university president sent all students an e-mail encouraging participation in the survey. Lastly, researchers sent two reminder e-mails to each student who did not respond to the initial solicitation to participate. Survey data were collected from early-October to mid-November 2005.

Sample Characteristics

Data were obtained from 3,140 students who responded to the web-based survey (response rate = 20 percent). Table 1 presents demographic characteristics of both the target population and the final sample of survey respondents. Compared to the target population, our sample slightly overrepresented females, whites, students from Mississippi and Louisiana, graduate students, and on-campus residents. These differences, however, were not deemed to be significant and no weighting of the data occurred.

Building on Dudasik's (1980) categorization of victims, we divided participants into three mutually exclusive groups based on their responses to two questions: 1) Did you, your significant other, any of your family members, or any of your friends evacuate due to Hurricane Katrina? and 2) Who evacuated? Instead of victims, we use the term "survivor" (i.e., one who lives through affliction or carries on despite hardships or trauma). Our groups were: 1) primary survivors (n = 163) that answered "yes" to question number one, and indicated that they, themselves evacuated; 2) secondary survivors (n = 1,305) that answered "yes" to question number one, and indicated that someone they knew, other than themselves, evacuated; and 3) tertiary survivors (n = 1,558) that answered "no" to question number one. Thus, primary survivors are those directly affected by the disaster by virtue of evacuating impacted areas. Secondary survivors are those who had strong ties to the disaster through family or friends who evacuated. Tertiary survivors are those who were further removed from the disaster and only experienced indirect impacts, (i.e., they were not connected to the disaster or evacuation through any primary relationships). A few participants (n = 114) could not be assigned to a group because they either had missing values for question number one, or they did not respond to question number two.

TABLE 1: Demographic Comparisons for Mississippi State University Target Population and Respondent Sample

Item	Target Population[a]	Respondent Sample[a]
Total N	15,889	3,140
Mean age (SD[b])	24.8 (7.8)	24.9 (7.9)
Gender		
Male	52%	43%
Female	48%	57%
Race		
White	75%	77%
Black	20%	16%
Asian	3%	5%
Hispanic	1%	1%
Other	1%	1%
Home state		
Mississippi	73%	76%
Alabama	4%	4%
Louisiana	1%	3%
Other	22%	17%
Student status		
Undergraduate	79%	74%
Graduate	21%	26%
Campus		
Starkville	88%	92%
Meridian	5%	4%
Distance	4%	2%
Continuing Education	2%	1%
Other	1%	1%
Residence		
On-campus	20%	24%
Off-campus	80%	76%
Mean High School Grade Point Average (SD[b])	3.2 (0.7)	3.4 (0.6)
Mean ACT Score (SD[b])	22.5 (4.6)	23.4 (4.8)

Notes: a. Reported percentages are based on the total number of valid responses; "don't know/not sure" and "no comment" responses were coded as missing. b. Standard deviation.

Findings

Our research findings follow the research questions previously presented. In the following sections, we describe results for the three survivor groups and make t-test comparisons between primary survivors and secondary survivors and between secondary survivors and tertiary survivors. Most comparisons revealed significant differences between primary survivors and secondary survivors and secondary survivors and tertiary survivors. To simplify our tables, t-test comparisons between primary survivors and tertiary survivors are not included.

In addition, we describe results and examine differences based on gender, race (whites and blacks), and student status (undergraduate and graduate). Although student status provides a proxy for age, it also indicates differences in level of maturity and is a relevant variable within a university setting. Finally, we examine differences based on personal losses experienced by students, specifically financial loss, damage to housing, and knowing someone injured or killed in the disaster. Following from research literature, we generally hypothesize that negative disaster impacts are more likely to occur among primary survivors, females, blacks, undergraduate students, and those who experienced loss when compared to their counterparts.

Storm Experiences and Behavioral Patterns

Participants were asked about their storm experiences and how they reacted to the disaster (see Table 2 and Table 3). First, they were asked to indicate their location when Hurricane Katrina struck their area on Monday, August 29th or Tuesday, August 30th. The majority of respondents (81.5 percent) indicated that they were either on the MSU campus, in Starkville, or within 50 miles of Starkville. Remaining respondents (18.5 percent) indicated they were in other Mississippi communities or out of state.

Students were asked to rate the storm severity at their location, how fearful they were, and how unsafe/threatened they felt during the storm on a scale from 1 to 10 (1 = low, 10 = high). In the sample as a whole, over one-half (53.1 percent) rated the storm severity as 6 or higher, one-third (33.6 percent) rated their fear of the storm as 6 or higher, and about two out of ten (18.7 percent) gave a rating of 6 or higher for level of threat. Students who were primary survivors perceived the storm to be more severe ($p \leq 0.001$), were more fearful ($p \leq 0.01$), and felt more threatened ($p \leq 0.01$) than the other two survivor groups. Similarly, secondary survivors perceived the storm to be more severe ($p \leq 0.01$), were more fearful ($p \leq 0.001$), and felt more threatened ($p \leq 0.001$) than tertiary survivors. Significant differences were also observed for gender with females reporting higher levels of storm severity ($p \leq 0.01$), storm fear ($p \leq 0.001$), and storm threat ($p \leq 0.001$) than males. Blacks indicated

TABLE 2: Student Storm Experiences and Losses by Survivor Groups and Total Sample

Item	Total Sample	Primary Survivors	Secondary Survivors	Tertiary Survivors
Location during storm: Percentage on MSU campus or within 50 mile radius	81.5	44.2	87.1	81.0 [d]
Storm severity perceptions: Mean scale score 1= not at all severe 10= extremely severe	5.6	6.8 [a]	5.7	5.5 [e]
Storm fear perceptions: Mean scale score 1= no fear 10= uncontrollable fear	4.4	5.5 [b]	5.0	3. 9 [d]
Storm safety perceptions: Mean scale score 1= felt perfectly safe 10= life threatening danger	3.6	4.2 [b]	3.7	3.4 [d]
Percentage reporting financial loss:	35.7	70.4 [a]	46.2	25.0 [d]
Percentage reporting housing damage:	39.5	72.4 [a]	48.9	29.1 [d]
Percentage reporting knowing someone who was killed or seriously injured:	5.3	12.7 [c]	8.5	2.2 [d]

Notes: a. t-Test significant at 0.001 for comparisons between primary and secondary survivors. b. t-Test significant at 0.01 for comparisons between primary and secondary survivors. c. t-Test significant at 0.05 for comparisons between primary and secondary survivors. d. t-Test significant at 0.001 for comparisons between secondary and tertiary survivors. e. t-Test significant at 0.01 for comparisons between secondary and tertiary survivors.

TABLE 3: Student Storm Experiences and Losses by Demographic Groups

Mental Health Indicator	Gender		Race		Student Status	
	Male	Female	White	Black	Undergrad	Grad
Location during storm: Percentage on MSU campus or within 50 mile radius	85.3	79.6 ‡‡‡	81.4	80.2 ‡‡‡	85.8	72.0 ‡‡‡
Storm severity perceptions: Mean scale score 1= not at all severe 10= extremely severe	5.5	5.7**	5.6	5.8	5.8	5.2***
Storm fear perceptions: Mean scale score 1= no fear 10= uncontrollable fear	3.5	5.2***	4.3	5.1***	4.6	3.9***
Storm safety perceptions: Mean scale score 1= felt perfectly safe 10= life threatening danger	3.1	4.0***	3.5	4.2	3.6	3.5
Percentage reporting financial loss:	34.5	35.6	36.2	36.5 ‡	37.7	28.1 ‡‡‡
Percentage reporting housing damage:	37.6	40.0	40.3	36.5 ‡‡‡	43.2	27.2 ‡‡‡
Percentage reporting knowing someone who was killed or seriously injured:	4.7	5.6	6.0	3.1 ‡‡	6.1	2.7 ‡‡‡

Notes: *** t-Test significant at 0.001 (1-tailed). ** T-Test significant at 0.01 (1-tailed). * T-Test significant at 0.05 (1-tailed). ‡‡‡ Chi Square significant at 0.001 (1-tailed). ‡‡ Chi Square significant at 0.01 (1-tailed).‡ Chi Square significant at 0.05 (1-tailed).

higher levels of storm fear ($p \leq 0.001$) than whites and undergraduate students reported higher levels of storm severity ($p \leq 0.001$) and storm fear ($p \leq 0.001$) than graduate students.

Respondents were asked about personal losses caused by Katrina. Over one-third (35.7 percent) reported incurring financial losses. As expected, primary survivors were more likely to experience financial losses ($p \leq 0.001$) than secondary. The latter group was more likely to experience financial losses ($p \leq 0.001$) than tertiary survivors. Although most students (90.7 percent) indicated that they could continue to live in their current residence, almost four out of ten (39.5 percent) indicated their residence sustained damage attributable to the hurricane. Again, primary survivors were more likely to report damage to their residence ($p \leq 0.001$) than secondary survivors and the latter group was more likely to experience residential damage ($p \leq 0.001$) than tertiary survivors.

More than a month after Katrina, 2.5 percent of students indicated they were still missing family members or close friends and 5.3 percent indicated that someone close to them was either killed or seriously injured during the storm. Primary survivors were more likely to fit this category ($p \leq 0.05$) than secondary survivors and the latter group was more likely to know someone killed or seriously injured ($p \leq 0.001$) than tertiary survivors.

Psychosocial and Mental Health Effects

As mentioned previously, mental health impacts were assessed using two standardized measures: the GHQ and the IES. The GHQ (Goldberg 1972) measures social dysfunction, depression, and loss of confidence in community settings, as well as nonpsychiatric clinical settings (e.g., primary care or general practice). The IES (Horowitz 1974; Horowitz, Wilner, and Alvarez 1979) measures event-specific psychological stress based on the rationale that highly stressful events are likely to produce high levels of recurring, unintentional, and distressing feelings and thoughts (intrusive stress), as well as high levels of intentional efforts to suppress these feelings and avoid reminders of the event (avoidance symptoms).

General Health Questionnaire (GHQ). The 12-item version of the GHQ was used with symptomatic responses scored as a "1" and nonsymptomatic responses scored as a "0." Total scores on the GHQ can range from 0 to 12, with higher scores indicating a greater likelihood for psychiatric distress. Subscale scores for social dysfunction range from 0 to 6, depression scores range from 0 to 4, and loss of confidence scores range from 0 to 2 (see Graetz 1991). Subscale scores were calculated and compared across survivor groups (Table 4), demographic groups (Table 5), and loss groups (Table 6).

TABLE 4: General Health Questionnaire Scale and Subscale Means and t-Test Comparisons by Survivor Groups and Total Sample

Mental Health Indicator	Total Sample	Primary Survivors	Secondary Survivors	Tertiary Survivors
General Health Questionnaire mean score	1.7	3.2 ***	2.2	1.3 ‡‡‡
Social Dysfunction Subscale mean score	1.0	1.8 **	1.3	0.8 ‡‡‡
Depression Subscale mean score	0.5	1.1 ***	0.7	0.4 ‡‡‡
Loss of Confidence Subscale mean score	0.2	0.3	0.2	0.1 ‡‡‡

Notes: *** t-Test significant at 0.001 for comparisons between primary and secondary survivors. ** t-Test significant at 0.01 for comparisons between primary and secondary survivors.
* t-Test significant at 0.05 for comparisons between primary and secondary survivors.
‡ ‡ ‡ t-Test significant at 0.001 for comparisons between secondary and tertiary survivors.
‡ ‡ t-Test significant at 0.01 for com parisons between secondary and tertiary survivors.
‡ t-Test significant at 0.05 for comparisons between secondary and tertiary survivors.

TABLE 5: General Health Questionnaire Scale and Subscale Means and t-Test Comparisons by Demographic Groups

Mental Health Indicator	Gender		Race		Student Status	
	Male	Female	White	Black	Undergrad	Grad
General Health Questionnaire mean score	1.5	1.8 *	1.7	1.8	1.8	1.4 **
Social Dysfunction Subscale mean score	0.9	1.1 **	1.0	1.1	1.1	0.9 *
Depression Subscale mean score	0.5	0.6 *	0.6	0.5	0.6	0.4 **
Loss of Confidence Subscale mean score	0.2	0.2	0.2	0.2	0.2	0.1 *

Notes: *** t-Test significant at 0.001 (1-tailed). ** t-Test significant at 0.01 (1-tailed).
* t-Test significant at 0.05 (1-tailed)

TABLE 6: General Health Questionnaire Scale and Subscale Means and t-Test Comparisons by Loss Groups

Mental Health Indicator	Financial Loss		Housing Damage		Know Someone Killed or Injured	
	Yes	No	Yes	No	Yes	No
General Health Questionnaire mean score	2.9	1.1 ***	2.7	1.1 ***	4.4	1.5 ***
Social Dysfunction Subscale mean score	1.7	0.7 ***	1.6	0.7 ***	2.5	0.9 ***
Depression Subscale mean score	0.9	0.3 ***	0.8	0.3 ***	1.4	0.5 ***
Loss of Confidence Subscale mean score	0.3	0.1 ***	0.2	0.1 ***	0.5	0.1 ***

Note: *** t-Test significant at 0.001 (1-tailed)

Overall, the mean total score on the GHQ for the 1,761 students who gave valid responses on all 12 questions was 1.7, indicating that, on average, students gave symptomatic responses to approximately 2 of the 12 questions. Using a standard cutoff of symptomatic responses for 2 or more questions, (see Reijneveld and Schene 1998), almost one-third (29.3 percent) could be classified as showing symptoms of psychiatric distress. The mean subscale scores for all respondents were 1.0 for social dysfunction, 0.5 for depression, and 0.2 for loss of confidence.

Primary survivors reported significantly higher levels of symptomatic responses for the total GHQ ($p \leq 0.001$), the depression subscale ($p \leq 0.001$), and the social dysfunction subscale ($p \leq 0.01$) than secondary survivors. Likewise, secondary survivors reported significantly higher levels ($p \leq 0.001$) of symptomatic responses for the total GHQ and the three subscales compared to tertiary survivors.

A similar pattern on the total GHQ and subscales was found for gender and student status (Table 5). Compared to male students, females scored significantly higher on the total GHQ ($p \leq 0.05$), social dysfunction subscale ($p \leq 0.01$), and depression subscale ($p \leq 0.05$). Undergraduate students scored significantl0y higher on the total GHQ ($p \leq 0.01$), social dysfunction ($p \leq 0.05$), depression ($p \leq 0.01$), and loss of confidence ($p \leq 0.05$) compared to graduate students. Finally, students who experienced financial loss, damage to their residence, and loss of or serious injury to someone they knew scored significantly higher on the total GHQ and the three

TABLE 7: Impact of Event Scale and Subscale Means and t-Test Comparisons by Survivor Groups and Total Sample

Mental Health Indicator	Total Sample	Primary Survivors	Secondary Survivors	Tertiary Survivors
Impact of Event Scale mean score	12.3	22.8 ***	15.6	8.5 ‡‡‡
Impact of Event Scale mean score	6.3	11.6 ***	8.1	4.3 ‡‡‡
Impact of Event Scale mean score	6.1	11.1 ***	7.7	4.2 ‡‡‡

Notes: *** t-Test significant at 0.001 for comparisons between primary and secondary survivors. ** t-Test significant at 0.01 for comparisons between primary and secondary survivors.
* t-Test significant at 0.05 for comparisons between primary and secondary survivors.
‡ ‡ ‡ t-Test significant at 0.001 for comparisons between secondary and tertiary survivors.
‡ ‡ t-Test significant at 0.01 for comparisons between secondary and tertiary survivors.
‡ t-Test significant at 0.05 for comparisons between secondary and tertiary survivors.
‡ ‡ t-Test significant at 0.01 for comparisons between secondary and tertiary survivors.
‡ t-Test significant at 0.05 for comparisons between secondary and tertiary survivors.

subscales ($p \leq 0.001$ across all groups and for all GHQ scales/subscales) than students who did not have those experiences (Table 6).

Impact of Event Scale (IES). The IES contains 15 questions—seven measuring intrusive recollections (e.g., having dreams about the event) and eight measuring avoidance behaviors (e.g., trying not to think about the event). Participants respond using a 4-point scale (i.e., not at all = 0, rarely = 1, sometimes = 3, often = 5). Total scores range from 0–75 and subscale scores range from 0–35 for intrusive stress and 0–40 for avoidance behavior. Total scores between 0 and 8 are in a subclinical range, 9 to 25 are in a mild range, 26 to 43 represent a moderate range, and 44 and above indicate a severe range (see Hutchings and Devilly 2005).

The average total score on the IES for all respondents was 12.3, suggesting that students experienced a mild range of PTSD symptoms (Table 7). When considering PTSD symptoms by survivor group, however, it was observed that the range of symptoms varies. Similar to results for the GHQ, primary survivors scored significantly higher ($p \leq 0.001$) on the IES (22.8), the intrusive subscale (11.6), and avoidance subscale (11.1) than secondary survivors. Indeed, almost two out of ten primary survivors (18.5 percent) fell into the severe clinical range. Similarly, secondary survivors reported significantly higher scores ($p \leq 0.001$) for the IES and subscale scores than tertiary survivors.

TABLE 8: Impact of Event Scale and Subscale Means and t-Test Comparisons by Demographic Groups

Mental Health Indicator	Gender		Race		Student Status	
	Male	Female	White	Black	Undergrad	Grad
Impact of Event Scale						
mean score	9.3	14.1 ***	12.0	13.2	12.8	9.8 ***
Intrusive Stress Subscale						
mean score	4.7	7.3 ***	6.3	6.7	6.5	5.3 ***
Avoidance Behavior Subscale						
mean score	4.7	6.8 ***	5.8	6.6	6.4	4.7 ***

Notes: *** t-Test significant at 0.001 (1-tailed). ** t-Test significant at 0.01 (1-tailed).
* t-Test significant at 0.05 (1-tailed)

Comparisons across demographic categories revealed patterns similar to those observed for the GHQ (Table 8). Female students had significantly higher scores on the total IES ($p \leq 0.001$), the intrusive stress subscale ($p \leq 0.001$), and the avoidance behavior subscale ($p \leq 0.001$) than did male students. Further, over 100 of the female respondents (7.4 percent) reported total IES scores above 44, which placed them in the severe category of PTSD. Likewise, compared to graduate students, undergraduate students scored significantly higher on the total IES ($p \leq 0.001$), the intrusive stress subscale ($p \leq 0.001$), and the avoidance behavior subscale ($p \leq 0.001$). A total of 128 undergraduate students (7.1 percent) were in the severe category of PTSD. No significant differences were observed between whites and blacks. Finally, students who experienced financial loss, damage to their residence, and loss of or serious injury to someone they knew scored significantly higher on the total IES and both subscales ($p \leq 0.001$ across all groups and for all IES scales/subscales) than students who did not have those experiences (Table 9). Although numerically small ($n = 41$), 31.8 percent of students who knew someone who was killed or seriously injured were in the severe PTSD category.

Contextualizing IES Findings. In previous disaster research, Gill and Picou (1998) reported mean intrusive stress scores of 17.2 for individuals in a community adjacent to a superfund site (four years after initial litigation); 16.5 for individuals in a community affected by the *Exxon Valdez* disaster (five months after the spill), and

TABLE 9: Impact of Event Scale and Subscale Means and t-Test Comparisons by Loss Groups

Mental Health Indicator	Financial Loss		Housing Damage		Know Someone Killed or Injured	
	Yes	No	Yes	No	Yes	No
Impact of Event Scale						
mean score	20.1	7.7 ***	18.2	8.3 ***	31.2	10.8 ***
Intrusive Stress Subscale						
mean score	10.4	4.0 ***	9.3	4.3 ***	16.4	5.5 ***
Avoidance Behavior Subscale						
mean score	9.9	3.8 ***	9.0	4.0 ***	15.0	5.3 ***

Notes: *** t-Test significant at 0.001 (1-tailed)

13.7 for individuals in a community that experienced a train derailment and toxic spill (18 months after the disaster). Comparing to clinical settings, Seidner, Amick, and Kilpatrick (1988) reported mean intrusive stress scores of 21.6 for clinical patients with symptoms due to bereavement within three to six weeks after death and 13.8 six months after death, as well as mean scores of 23.8 for rape victims in the initial assessment and mean scores of 11.4 two years after the rape.

Gill and Picou (1998) reported mean avoidance symptoms scores of 16.4 for individuals in a community adjacent to a superfund site (four years after initial litigation); 11.1 for individuals in a community affected by the *Exxon Valdez* disaster (five months after the spill), and 11.4 for individuals in a community that experienced a train derailment and toxic spill (18 months after the disaster). Seidner, Amick, and Kilpatrick (1988) reported mean avoidance scores of 26.0 for rape victims in the initial assessment and mean scores of 16.0 two years after the rape.

Overall, disaster researchers have found significant levels of psychological stress associated with survivors who experience physical damage to property, loss of home, or displacement from one's community (e.g., Perry 1985; Drabek 1986; Raphael 1986; Baker 1991; Norris 2002). This pattern was confirmed by our research.

TABLE 10: Percent and t-Test Comparisons of Self-Assessed and Actual Educational Performance (Fall 2005) by Survivor Groups

Impact of Hurricane Katrina	Total Sample	Primary Survivors	Secondary Survivors	Tertiary Survivors
Felt it had negatively impacted their Fall 2005 semester performance	39%	64% ***	48%	28% ‡‡‡
Semester GPA (Fall 2005)	3.12	3.06	3.07	3.20 ‡‡‡
Cumulative GPA	3.15	3.07	3.12	3.20 ‡‡

Notes: *** t-Test significant at 0.001 for comparisons between primary and secondary survivors. ** t-Test significant at 0.01 for comparisons between primary and secondary survivors. ‡‡‡ t-Test significant at 0.001 for comparisons between secondary and tertiary survivors. ‡‡ t-Test significant at 0.01 for comparisons between secondary and tertiary survivors.

Educational Performance

We examined how the disaster affected educational performance in the 2005 fall semester through self-assessed and actual performance indicators. First, students were asked, "Since Hurricane Katrina, has your academic performance been negatively affected?" This was scaled from 1 (definitely not) to 6 (definitely). After completion of the fall semester, we obtained grade point average (GPA) data for all students who completed both the web survey and the semester. These data included the fall semester GPA and their cumulative GPA. We examined these variables by survivor groups, demographic groups, and loss groups.

As indicated in Table 10, over one-third (38.8 percent) of all students felt the hurricane had a negative impact on their academic performance (i.e., their response was either somewhat likely, very likely, or definitely). A significant difference ($p \leq 0.001$) was found between primary and secondary survivors and between secondary and tertiary survivors on self-assessment of academic performance. This was most pronounced among primary survivors with almost two-thirds (63.5 percent) reporting low self-assessments of their academic performance.

An examination of GPA data for the fall 2005 semester revealed no significant differences between primary and secondary survivors. Tertiary survivors, however, had significantly higher semester GPAs, suggesting the disaster experience could have significantly lowered GPAs for primary and secondary survivors. Likewise, tertiary survivors had a significantly higher cumulative GPA than primary and

TABLE 11: t-Test Comparisons of Self-Assessed and Actual Educational Performance (Fall 2005) by Demographic Groups

Impact of Hurricane Katrina	Gender		Race		Student Status	
	Male	Female	White	Black	Undergrad	Grad
Felt it had negatively impacted their Fall 2005 semester performance	40%	39%	39%	40%	42%	40% ***
Semester GPA (Fall 2005)	3.06	3.17 ***	3.19	2.72 ***	2.96	3.69 ***
Cumulative GPA	3.10	3.19 ***	3.22	2.73 ***	2.99	3.60 ***

Note: *** t-Test significant at 0.001 (1-tailed)

secondary survivors. It is unclear if cumulative GPA was negatively affected by fall 2005 semester grades or if other factors may be affecting these differences (see also Fee et al. 2006).

Analysis of differences across demographic groups (see Table 11) revealed few significant differences. Almost 4 out of 10 males (39.7 percent) and females (39 percent) and 4 out of 10 blacks (39.6 percent) and whites (38.9 percent) felt their academic performance was negatively affected by Katrina. Undergraduate students (41.6 percent), however, were more likely to feel their academic performance had suffered ($p \leq 0.001$) when compared to graduate students.

An examination of GPA data for the fall 2005 semester revealed significant differences based on gender, race, and student status, with females, whites, and graduate students achieving a higher GPA than their counterparts. Similar findings for cumulative GPA scores across demographic groups suggest such patterns may be normal and that factors other than the disaster may account for these differences.

Significant differences were found between loss groups with respect to self-assessed and actual academic performance (Table 12). Students who reported financial loss, housing damage, and knowing someone injured or killed by the disaster were more likely to believe their academic performance had been negatively affected and to have lower semester and cumulative GPAs. This was most pronounced among students who knew someone who was injured or killed due to Katrina-related events.

TABLE 12: Means and t-Test Comparisons of Self-Assessed and Actual Educational Performance (Fall 2005) by Loss Groups

Mental Health Indicator	Financial Loss		Housing Damage		Know Someone Killed or Injured	
	Yes	No	Yes	No	Yes	No
Felt it had negatively impacted their Fall 2005 semester performance	53%	18% ***	47%	20% ***	70%	28% ***
Semester GPA (Fall 2005)	3.01	3.19 ***	3.02	3.20 ***	2.77	3.15 ***
Cumulative GPA	3.06	3.21 ***	3.08	3.21 ***	2.84	3.18 ***

Note: *** t-Test significant at 0.001 (1-tailed)

TABLE 13: Top Five Most Utilized Campus Services by Survivor Groups

Rank By Most Utilized	Primary Survivors	Secondary Survivors	Tertiary Survivors
1	Campus Website (42%)	Campus Website (33%)	Campus Website (33%)
2	Mass e-mail (38%)	Mass e-mail (31%)	Mass e-mail (29%)
3	Financial aid (24%)	Financial aid (17%)	Other faculty (10%)
4	Other faculty (20%)	Other faculty (15%)	Academic advisor (10%)
5	Academic advisor (20%)	Student organizations (12%)	Student organizations (9%)

Note: Other faculty refers to those faculty members other than the student's academic advisor.

Utilization of University Services

Like most universities, Mississippi State provides services used by students in the course of everyday activities (e.g., institutional communication services). Fewer institutions may be prepared to offer services that deal directly with disaster impacts on students. To assess how MSU's services were used, students were asked to rate the level of support provided by various university services in helping them cope with the disaster. Table 13 shows the top five most utilized university services for each survivor group. The most utilized services appear to be the campus website (33.3 percent) and mass e-mails from the MSU administration (30.4 percent), basic services used on a routine basis. Primary and secondary survivors tended to utilize financial aid services more so than tertiary survivors and all students tended to use faculty members and academic advisors as forms of support. Although specific programs such as counseling and support groups were not among the top five used by students, they did provide important services for some students.

Summary and Discussion

Our findings suggest that differential impacts of Hurricane Katrina on Mississippi State University students were largely a function of their interpersonal experiences with evacuation events and physical loss created by this historic disaster. Selective differential impacts were also observed for race, gender, and student status. Although only a minority of students physically evacuated in response to Katrina, many students were affected by the disaster in myriad ways. Students who evacuated (primary survivors) experienced greater physical, financial, and psychosocial impacts than those students who only had family or friends who evacuated (secondary survivors), or those who were not connected to the evacuation through any primary relationships (tertiary survivors). In particular, those who experienced financial loss, housing damage, or knew someone who was killed or injured by the storm reported higher levels of psychological stress and trauma. Females, blacks, and undergraduates tended to perceive the storm as more threatening than males, whites, or graduate students and psychological stress and trauma tended to be higher for females and blacks as well. In the postimpact recovery phase of Katrina, primary survivors were also more likely to have utilized supportive campus services to deal with their stress or hurricane-related problems. Finally, primary and secondary survivors were significantly more likely to have had their educational performance for the semester negatively impacted compared to tertiary survivors.

Consistent with past research (Dudasik 1980), our findings suggest that survivors who have either direct or indirect personal ties to a disaster event report greater impacts than those who have only distant connections to the hazard. In particular, our research lends support to studies suggesting that people who are forced to

evacuate from one's community—or who have family members or close friends who do—experience more psychological stress than those who have no interpersonal connections to specific disaster or evacuation events (Perry 1985; Drabek 1986; Raphael 1986; Baker 1991; Pickens et al. 1995; Norris 2002). In addition, our results support previous studies showing that hurricanes often produce greater psychosocial impacts for female and black students than their male and white counterparts (Gutierrez, Hollister, and Beninati 2005; Van Willigen et al. 2005). We speculate that this may be caused by broader social constructions of gender and minorities in which women and minorities tend to perceive themselves as particularly vulnerable to disasters (Enarson and Morrow 1997; Bateman and Edwards 2002).

Despite extensive literature examining psychosocial effects of hurricanes on various coastal populations, few researchers have examined the impacts of a regionally catastrophic hurricane on college students from a major state university. Although MSU students generally did not incur the same degree of evacuation stress, psychosocial trauma, economic loss, and university displacement experienced by college students from New Orleans universities (see Ladd, Marszalek, and Gill 2006; Ladd, Gill, and Marszalek forthcoming), the hurricane's secondary impacts on the MSU population were nevertheless substantive and disruptive. Paralleling existing hurricane studies on students (e.g., Pickens et al. 1995; Gutierrez, Hollister, and Beninati 2005; Van Willigen et al. 2005), MSU respondents sustained financial losses, residential damage, psychiatric distress, and a diminished sense of their educational performance. Indeed, our survey data revealed that over one-third (38.8 percent) of students felt that the hurricane had negatively impacted their academic standing for the semester. Students who were either primary or secondary survivors, incurred financial loss, had family members or friends who were missing, or knew someone who was killed or injured had a significantly lower GPA than did students who did not incur such impacts (Fee et al. 2006). Past research has similarly noted that storms and disasters often generate a number of disruptions to the academic calendar that can pose detrimental effects on both a university's educational mission and individual student achievement (Holmes 2002; FEMA 2003).

Survey data like ours can assist universities to become more resilient institutions in the aftermath of a disaster. In particular, university officials should be aware that students who are directly and indirectly impacted by stressful events like hurricanes can have psychosocial needs and symptoms the institution can anticipate and for which they can prepare. The ability of universities to provide emotional and tangible social support services to disaster survivors can be a means of improving mental and physical health, as well as maintaining educational performance among college students who have experienced trauma. Student disaster survivors and observers are especially likely to manifest impaired psychological

and physical functioning, a generally diminished sense of well-being, and an increased use of health care services (MacGeorge et al. 2004).

Many universities, however, do not have sufficient staff to handle students affected by disasters. We suggest that educational institutions try to increase their capacity in this regard by utilizing volunteers (perhaps from other campus staff), opening phone banks, bringing in community mental health professionals, or requesting emergency assistance for such services from other schools. Clearly, universities need to develop campus wide plans for providing these services in the aftermath of a regional disaster.

Empathetic communication from university administration, increased mental health counseling, financial aid, academic assistance, and student support groups can also serve to diminish negative impacts of future disasters. Other studies indicate that university faculty can play a crucial role in the ability of students to recover emotionally and academically after a disaster, particularly in regard to instituting more flexible classroom standards regarding course assignments and grading procedures (Gutierrez, Hollister, and Beninati 2005).

College students throughout the southern Gulf region are extremely anxious about returning to their campus communities for the fall 2006 semester when another potentially active hurricane season will be underway. This anxiety could remain for several years. Indeed, once a community has experienced a disaster like Katrina, levels of concern and apprehension about a reoccurrence of such an event are likely to increase significantly (Moore and Moore 1996). With the increased probability for more devastating storms like Katrina to disrupt—if not physically destroy—campus communities on which students and faculty depend, regional universities must work for higher levels of disaster preparedness that can facilitate more appropriate risk perceptions and adaptive responses (Drabek 1991; Riad and Norris 1996). At the same time, institutions of higher education must also initiate more comprehensive social support and counseling services to address the inevitable disaster emergencies that college students are likely to face in the post-Katrina environment. Given an increasing awareness of catastrophic events that universities in coastal regions face, disaster researchers must pay greater attention to these risks and how they sociologically compare with other populations and institutions.

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Katrina Bankrupts the Information-Rich: Information Poverty in Slidell, Louisiana

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Abstract

When a disaster obstructs or obscures life-sustaining or life-fulfilling information, the persons affected may be said to experience an *information disaster*, a common byproduct of a natural catastrophe. A prolonged series of information disasters may eventually evolve into an *information poverty spell*—a temporary postdisaster situation characterized by several weeks or months of information scarcity. A case study of the postdisaster information behaviors of Katrina victims in Slidell, Louisiana, a New Orleans suburb, reveals actions and attitudes that may develop during an information poverty spell in an ordinarily information-rich bedroom community. Observing and reporting these behaviors may encourage others to perform subsequent studies using other research methods. Further comparisons of the studies may enable disaster stakeholders to determine how information behaviors affect the severity of information disasters. Better understanding may inspire information scientists to collaborate with disaster managers to advocate more effective information behaviors before, during, and after disasters.

Keywords: disaster(s), Hurricane Katrina, information behavior, information seeking, information sharing, Slidell, Louisiana

When Hurricane Katrina raged through the New Orleans suburb of Slidell, Louisiana, on August 29, 2005, it pushed the community's information sharing methods at least one hundred years into the past. Not only were the residents without running water, open grocery stores, and habitable homes, they were also without their usual information and communications technology (ICT) to connect them to information *about* water, groceries, and shelter. These ordinarily affluent residents were forced to turn their concentration from the quest for *life-fulfilling* information to a quest for *life-sustaining* information. Maslow (1954) believed that people seek satisfaction of their needs hierarchically (see Figure 1); and they do not address their growth (life-fulfilling) needs until their deficiency (life-sustaining) needs are met.

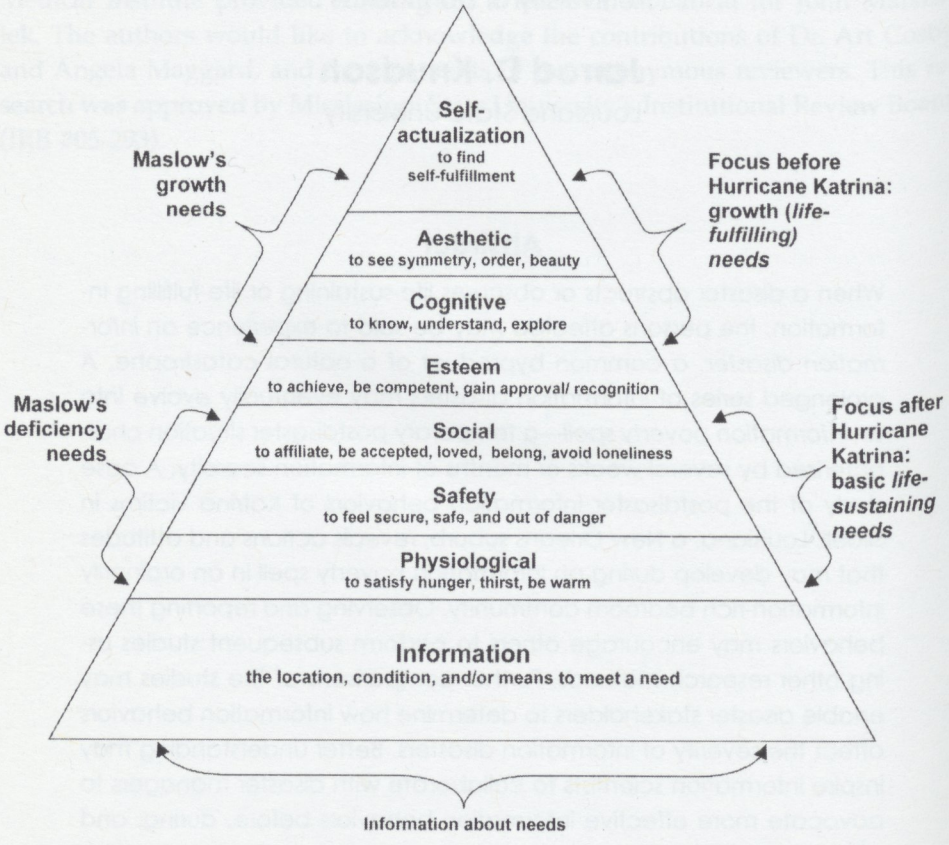


FIGURE 1: Postdisaster information needs in Slidell, Louisiana based on Maslow's Need Hierarchy

An unfortunate byproduct of many civil, technological, or natural disasters are ICT disasters—situations characterized by the inability to use customary ICT to access or apply postdisaster information—the life-sustaining information that reveals how and where basic survival needs can be met.

Before Katrina, probably because of their economic status (Gratton 1980), most Slidell residents concentrated on meeting their life-fulfilling needs. Katrina forced Slidell residents to abandon life-fulfilling needs in order to concentrate on meeting their life-sustaining needs (see Table 1). Interestingly, in all recorded instances, Slidell residents first expressed the need for information. After all, no needs could be met without the information that revealed the location, condition, and means to meet the need. Unfortunately, in most instances in Slidell, the postdisaster

TABLE 1: Postdisaster Life-Sustaining Needs from the Three Lowest Levels of Maslow's Hierarchy of Needs (see Figure 1)

Physiological	Safety and Security	Love and Belonging
Food and water	Bank/financial records	Family
Clothing	Blue Roof providers[a]	Friends
Grocery stores/ restaurants	Employment (workplace/business)	Heirlooms
Housing/shelter during rebuilding or relocating	Healthcare/medicine (hospitals, pharmacies, clinics)	**Information sources (ICT, libraries, city offices)
Information sources (ICT, libraries, city offices)[b]	Homestead (insurance assessment/claims, repair services)	Keepsakes
Transportation/road-ways/fuel	Information sources (ICT, libraries, city offices)[b]	Pets
Utilities (electricity for air conditioning, running water)	Police	
	Valuables (cash, jewelry, antiques, art)	

Source: Maslow 1954.

Notes: a. FEMA provides blue plastic sheeting for damaged roofs to prevent roof leakage until roof is repaired b. Information sources were used to learn the location of, condition of, or means to retrieve information regarding life-sustaining needs.

information existed, but was *inaccessible* because ICT was damaged; or it was *inapplicable* because the information content was irrelevant or inaccurate (Britz 2004).

Interestingly, Slidell residents in this study indicated that their major concern was finding an information source that would reveal the location for temporary food and water, the location of shelter or condition of their homes, and the location and condition of their family and friends. If someone has a need such as hunger, the applicable postdisaster information would reveal, for instance: the *location* of the Red Cross food distribution center, the *condition* of the roads that lead to the location, and/or the available *means* to travel to the location.

TABLE 2: Information Poverty: Definitions and Descriptions from the Literature

	Source
1. A condition that besets: · those with low-level processing skills · those who are outside the mainstream culture · those with a predisposition toward despair, fatalism, and a "pervasive sense of helplessness" · usually those who are Spanish-speaking Americans, Indians and Eskimos, poor blacks and whites including poor farmers, migrant workers, the aged, prisoners, the blind and the deaf	Childers 1975, 32–34
2. The absence of computers and access to communication.	Buckley 1987
3. A growing gap between those with access to information versus those who lack it.	Broadbent 1990
4. The state of the economically poor.	Doctor 1991; Haywood 1995
5. Bias against certain information channels, especially the library, and more generally the printed word.	Sweetland 1993
6. Ignorance about available options.	Cronin 1995

When ICT disasters are widespread and prolonged, as they were in Slidell, residents are thrust into a temporary state of information poverty (see Table 2), a condition that is most often associated with underprivileged groups (Britz 2004; Britz and Blignaut 2001; Childers 1975; Hersberger 2002; Jaeger and Thompson 2004). However, in the case of Slidell, Katrina instigated an information poverty spell in an ordinarily comfortable, information-rich community by temporarily interrupting the accessibility of information and by compromising the applicability of information content. The information-poor are unable to access information because of inferior or nonexistent ICT. They are also unable to apply information to their needs because the information is convoluted, inadequate, and/or irrelevant (Britz 2004).

Although early information scientists Shannon and Weaver propose that "information is the reduction of uncertainty" (1948), inaccessible or inapplicable information

	Source
7. Geographical phenomenon identified internationally (e.g., so-called information rich and information poor countries) as well as nationally, in terms of geographic areas (e.g., rural or urban areas).	Chatman 1996
8. An information gap between those with information technology and policy and those without.	Steele-Vivas 1996
9. Inaccessibility to information due to: · illiteracy · lack of awareness of the relevance of information · lack of infrastructural facilities	Aguolu 1997
In summary, information poverty: · relates to the availability and accessibility of essential information that people need for development; · has links to economic poverty; · closely relates to a person's ability/inability to understand and interpret information and, although it is an international problem, manifests within specific situations and contexts; · is that situation in which individuals and communities, within a given context, do not have the requisite skills, abilities, or material means to obtain efficient access to information, interpret it and apply it appropriately; and · is further characterized by a lack of essential information and a poorly developed information infrastructure.	Britz 2004

increases uncertainty, especially following a disaster. Slidell, as one of the most prosperous communities in Louisiana, was accustomed to daily information connectivity. How did its residents communicate when connectivity was lost? Slidell ordinarily has many formal and informal information agencies, such as parish and city offices, phone services, cable television, Internet/e-mail, or libraries. These institutions preserve information, organize it, and ensure that it is easily retrieved (Buckland 1991; Ratzan 2004). However, Hurricane Katrina thwarted the realization of many social ideals, including the availability of postdisaster information. For 12 days Slidell residents were trapped in their neighborhoods without power or communications until city workers cleared the trees and power lines that obstructed all streets in most of the city—an estimated 230 kilometers (143 miles) of impassable roads (WRAL.com 2006). The residents could not send or receive information to or from any outside communities—local, state, or national. Even when information services were gradually restored, much of the postdisaster information was inaccessible or inapplicable. (Cell phone service would still be erratic months after Katrina.) It was this prolonged inaccessibility and inapplicability of information that thrust the ordinarily information-rich Slidell residents into an information poverty spell—a state that many endured for many months.

Purpose of Study

Burnett, Besant, and Chatman define information behavior as "a construct through which to approach everyday reality and its effect on actions to gain or avoid the possession of information. The choice of an appropriate course of action is driven by beliefs concerning what is necessary to support a normative way of life" (2001). Although information scientists have researched the phenomenon of information behavior extensively (Case 2002), the study of information behavior following major disasters is scant or absent in the literature.

How do residents of an information-rich community cope with information poverty? Researchers and emergency managers need to know what information behaviors accompany an unfamiliar, unexpected spell of information poverty. Were those who had always used ICT less able to alter their information behaviors in order to find, send, and receive postdisaster information? Researchers and emergency managers need to know if innovative, nontechnological methods for getting and receiving information emerge more slowly for those who depend on ICT.

Benefits of Study

Information, though intangible and nonconsumable, is a necessary resource to sustain and fulfill life. It may be the most abundant resource because it does not

deplete with use or corrode with time as do tangible resources. Unfortunately, neither its abundance nor its resilience determines its worth. If it is inaccessible or inapplicable, it has no value at all. Katrina wiped out information services—no phones, no cells, no television, no Internet. Traveling by automobile to look for people or signs providing information was impossible or at least hazardous. Most neighborhoods, nestled in heavy pine woods, were cluttered with downed pine trees, as well as downed power lines and debris, which impeded local travel for several weeks. Unfortunately, the scarcity or contamination of postdisaster information was as threatening to survival as the scarcity or contamination of water. Like drinking water, information became unavailable. When it did become available through social services, few residents knew it was available or where to look for it. When it became available again, residents doubted its quality. Was it tainted? Was it safe to use? Television, radio, and Internet broadcasted postdisaster information—but most of those who heard it were not in the affected areas. Many who evacuated looked to a popular Web-based discussion tool, Weblogs, commonly called "blogs." They seemed to be the only Web sources with information about Slidell. Sadly, the blogs were found to be largely unreliable, and therefore inapplicable. Many blogs about Slidell (Oberkirch 2005) markedly exaggerated the extent of the damage. It was true that many areas of Slidell were devastated and even obliterated; however, many blogs mistakenly reported high flooding in areas in northern Slidell that only took curb-level water. Many evacuees who returned the first week were shocked and relieved to find their homes still standing and unscathed by flooding.

Phenomenological data may provide insight into the street-level information behavior during the unexpected collapse of all aspects of the social infrastructure. Conclusions drawn from such a study could improve information sharing among victims of and responders to disaster. Researchers and practitioners could more easily envision and create methods for communicating life-sustaining or life-fulfilling information when disaster impedes or even obliterates typical methods for sharing information. Many people do not plan for disasters without the use of television, phones—both hard line and cellular—or even Internet. It is not apparent if people who are accustomed to using everyday ICT to communicate are more or less vulnerable than those who do not have cell phones, television, or Internet.

Studying postdisaster information behavior—the actions and attitudes that influence the needing, finding, choosing, or using of postdisaster information—in a predominantly middle-class community may isolate the information behaviors that result in information poverty spells among the ordinarily information-rich. The findings may lead scientists to implement ICT methods that prevent, or at least mitigate, prolonged devastation to lifestyle and livelihood in the postdisaster environment of average communities.

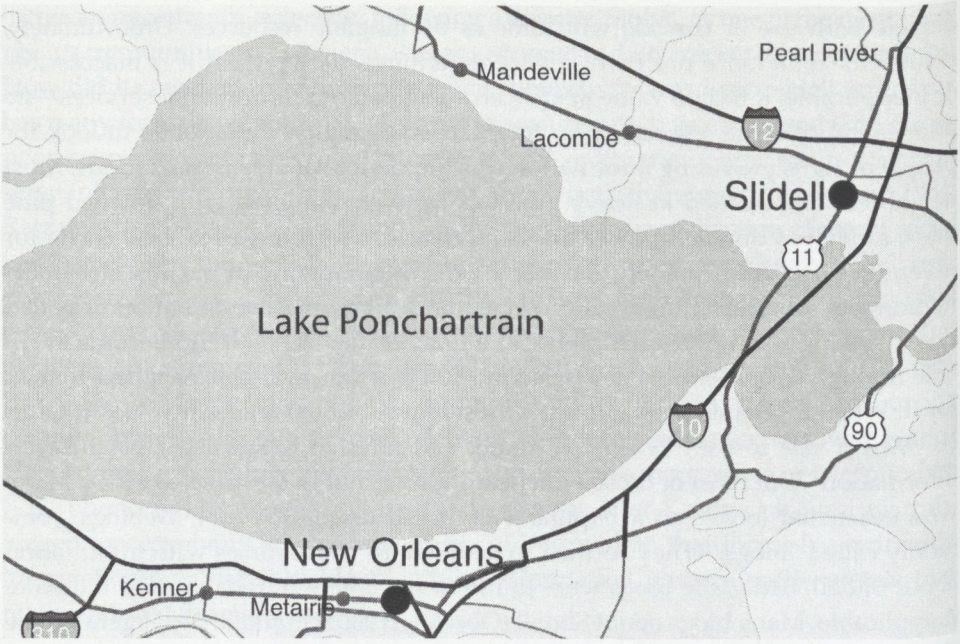


FIGURE 2: New Orleans and Slidell, Louisiana

Scope of the Study

Many researchers are already investigating the Katrina-induced devastation experienced by the welfare communities of areas like Orleans Parish (see Figure 2) where the low median household income may limit access to ICT. Consequently, the authors saw the need to study the devastation experienced by middle- to upper-class residents in Slidell, a community in St. Tammany's Parish where higher incomes (see Table 3) may cause ICT to be become commonplace or even taken for granted. Data gathered for this study, including extensive resident interviews, focused on areas where residents' household income appeared to be close to or above the U.S. 1999 median household income of $41,994 (Infoplease.com 2000). The authors designed a case study to observe the information behaviors of persons directly affected by disasters that propagate ICT disasters. In order to triangulate the findings, they implemented several methods including newspaper, television, and Internet reports; site explorations and photo shoots, personal interviews; and feedback from respondents. They designed the methodology with the intent to learn what information the isolated residents were seeking and how their behavior affected their finding and/or using of postdisaster information.

Table 3: Comparison of Incomes and Poverty: Orleans Parish and St. Tammany Parish, 1999

Geographic Area	Median Household Income ($USD)	Per Capita Income ($USD)	Percentage of Population with Income Below Poverty Level
St. Tammany Parish	47,883	22,514	9.7
Orleans Parish	27,133	17,258	27.9

Source: U.S. Census Bureau, 2000 Census: Demographic Profile Highlights: Slidell, Louisiana 2000.

Methodology

For five days following Katrina, the researchers conferred with Denton, Texas, shelter evacuees from Slidell, Louisiana, and searched for news articles about Katrina's affect on Slidell—an area that was directly affected, but temporarily isolated from outside interest. The researchers obtained general information about Katrina to provide a background of the disaster's impact on Slidell. The researchers then narrowed the articles from local or national news services in newspapers and on the Internet to specific instances of information behavior among those affected by Katrina, specifically Slidell.

Tisha Slagle Pipes applied for and received approval from the University of North Texas Institutional Review Board to interview human subjects directly affected by disaster. Jarrod D. Knudson traveled to Slidell after the roads opened north of Slidell's Gause Boulevard. Pipes arrived September 14, just one day after most other areas in Slidell were opened to traffic. The two researchers observed the site, photographed the damage, and began the process of interviewing residents. During the next several days and subsequent visits, they conducted and recorded interviews with people in damaged neighborhoods. The respondents were asked questions, including the following:

- How did you receive warning of the disaster?
- Where and when did you get the information?
- What types of information were you seeking?
- Did you get information, and if so, how?
- Where and from whom did you get information?
- Why did you choose this method to look for the information?

The researchers asked a set of predetermined questions, but encouraged respondents to expound on their personal experiences. Snowball sampling was used to identify more respondents in the area, that is, each respondent was asked to suggest neighbors or acquaintances who would be willing to share their stories.

The researchers also interviewed city officials including the mayor, representatives from the Slidell Police, Emergency Management Department, U.S. Army, Red Cross, the Federal Emergency Management Agency (FEMA), animal shelters, and the EPA. The officials were interviewed using open-ended questions including the following:

- When and how did you receive and send information warning of the disaster?
- What types of information did you find that victims and other responders were seeking?
- What method was used to receive the information?
- Why was this method used?

On subsequent trips, the researchers contacted the original respondents for updates and interviewed more residents. The process was repeated until the data seemed redundant.

The recorded interviews were transcribed and analyzed. If necessary, respondents were contacted for clarification or missing information. A draft of the report was sent to some respondents for feedback before submission for publication.

Conclusions were drawn based on two assumptions: 1) the data gathered was accurate, and 2) the authors correctly interpreted the intent of the data providers. Although it is not yet apparent if the analysis of the experiences of Slidell residents may be generalized to the general population of small-town middle-to-upper class residents, it is hoped that the findings may be used in future comparative studies. Information scientist Carol Kuhlthau asserts that such case study findings are valuable because, unlike experiments and closed-question surveys, the case study endeavors to learn "why" persons behave toward information as they do, and because case study results can be used for comparison in subsequent studies that implement other research methods (1999). Comparisons may bring scientists closer to understanding typical postdisaster information behavior during information poverty spells experienced by the ordinarily information-rich.

The City of Slidell

Slidell is located in St. Tammany Parish, an area that is often called New Orleans' North Shore, 23 miles northeast of New Orleans across Lake Ponchartrain.

Originally established as a resort area for New Orleans tourists and sophisticates who could afford steamship or train fare for the trip across the lake, St. Tammany still caters to tourists and families who enjoy the quiet atmosphere of small towns.

Slidell's affluence, as one of the wealthiest communities in Louisiana, stems from its centralized location amid the three lunar landing program sites built by NASA in the 1960s. The city of approximately 25,000 residents (Infoplease.com 2000) traces its beginning to 1882 when the New Orleans and Northeastern Railroad chose the site because it was the "first high ground north of Lake Pontchartrain" to set up a building camp for workers who were contracted to build a railroad from New Orleans to Meridian, Mississippi. In 1888, the Louisiana Legislature chartered the City of Slidell (City of Slidell 2005).

The 2000 U.S. Census reported that 60 percent of Slidell's residents earn more than $35,000 annually. The community as a whole had a median household income of $42,856 in 1999, a figure that is nearly $1,000 higher than the U.S. median and more than $10,000 higher than the Louisiana median. The 2000 U.S. Census further reported the median percentage of residents below the poverty level in Slidell to be 9.5 percent in 1999—much lower than the 12.4 percent median in the United States or the 19.6 percent median in Louisiana (Infoplease.com 2000).

Katrina's Assault on Slidell

After Katrina swept over Slidell, the small city was left with "waist-high or higher water in . . . [thousands of] homes . . . that ruined carpets and furniture, and . . . [deposited] a suffocating, rank black muck" on floors, walls, cabinets, household items, and clothing. Because most roads prevented transportation by car, "people were using shopping carts, strollers and dollies to carry the possessions they wanted to save. Evacuees were not allowed to drive back through police roadblocks, and were forced to walk miles if they wanted to see their homes" (*Mobile Register*, September 1, 2005). Katrina decommissioned all of Slidell's public systems: its power, water, ICT, transportation, and schools. Extensive damage to private property left residents, including the 10–12,000 with middle-to-upper household income, suddenly stricken with poverty, devoid of the customary comforts of their homes.

Katrina Damages Property

A few weeks after Katrina, the waters had receded, revealing the extent of the damage. Katrina had crushed hundreds of kilometers of Slidell's greenery, along with thousands of private dwellings and businesses. Residents in northern Slidell reported curb-level flood waters that had impeded automobile travel for a day.

In most cases, the destruction was limited to rooftops, fences, outdoor furniture, and/or utility sheds. Lawns were laden with fallen trees and dangling power lines. Twisted tree roots protruded through broken chunks of pavement—many with their trunks snapped and resting in the clefts of the rooftops they had crushed. Huge stumps, piles of trash, and freshly cut wood cluttered the curbs. Many people were out cutting and clearing trees. Electricity was restored in two weeks, but residents still did not have phone, cable television, or Internet services.

In central to southern Slidell, residents reported the onslaught of several feet of flood waters that receded within a few days. An estimated 75 percent of Slidell residents had water in their homes. These residents also sustained damage to rooftops, fences, outdoor furniture, utility sheds, garage doors, screen doors and/or siding, along with inside framework (floors, walls), plumbing pipes, electrical wires, most or all household goods, furnishings, and automobiles. Lawns in these areas were also laden with fallen trees and dangling power lines and yards littered with twisted tree roots, huge stumps, piles of trash, and freshly cut wood. Bedraggled people were busy hurling mud-covered items atop giant, jagged heaps of molded furniture, appliances, clothing, and toys. Electricity had not been restored and residents had no phone, cable television, or Internet services.

In southern Slidell, near and along the coast of Lake Ponchartrain, residents reported total submersion in flood waters. In most cases, the destruction included entire homes, all household goods, furnishings, and automobiles. In areas along the shores of Lake Ponchartrain, splintered stilts that had days before supported lake houses jutted against the horizon. Warped scaffolds exposed remnants of kitchens, bedrooms, and dens. Massive mountains of rubble crowded the shoulders of the narrow roads. A few people were sifting through the wet wreckage that covered their yards and much of the area where their homes once stood. Because the storm surge was over 20 feet high in these areas, the Slidell police, fire fighters, emergency workers, and volunteers had to use boats to rescue approximately 350 people from rooftops. Some rescuers, unable to use their traditional methods of communicating, borrowed Citizen Band (CB) radios to pass information to other rescuers (Rodríguez, Trainor, and Quarantelli 2006).

Katrina Deprives Slidell of Information

Although information was an abundant and pervasive resource in Slidell before August 29, 2005, it became tragically scarce after Katrina. While still in the Gulf of Mexico, the hurricane's 175 miles-per-hour winds pushed Lake Ponchartrain over half of Slidell's 10,000 homes. Within minutes, walls of water washed away years of past work and hopes for future wealth. In the still inhabitable homes, water stagnated and spawned putrefaction onto life-sustaining, life-fulfilling items

including groceries, clothing, furnishings, valuables, and keepsakes. According to Mayor Ben Morris, 3,500 to 4,000 homes were still uninhabitable six months after Katrina (Morris 2005). Approximately 25,000 residents had no running water, no electricity, and no way—at least temporarily—to get information about their families and homes.

Katrina had left thousands of residents who stayed in Slidell without access to ICT or people. If their phones, televisions, and computers survived, they were useless without ICT provider services. They were separated from others by high waters, storm debris, and city workers or authorities.

Ordinarily Slidell residents employ a combination of ICT actions to send/provide and receive/request needed information (see Table 4) within the community. The concept of sending/providing and receiving/requesting needed information is often called "push-pull" by information and communications scientists (Borgmann

TABLE 4: Typical Pre-Katrina Actions of Slidell Residents to Send/Provide or Receive/Request Information

Actions to Provide	Actions to Receive
Local television station broadcasts property damage information in Slidell	Turns on local television station in hopes of learning about their home in Slidell
National television network broadcasts property damage information in Slidell	Turns on national television network in hopes of learning about their home in Slidell
Individual creates a "Hurricane Katrina in Slidell" blog	Posts a question to a blog regarding Hurricane Katrina in Slidell
FEMA phones the Slidell mayor to let him know when they will arrive	Slidell mayor phones FEMA to find out when they will arrive
Red Cross announces the location of a food and water distribution center on local radio station	Individual listens to the local radio station in hopes of learning the location of a food and water distribution center
Slidell officials post instructions for contacting power provider to restore electricity to city's website	Accesses Slidell website for instructions on restoring electricity
Slidell resident e-mails/phones evacuees to let them know it is safe to come home.	Slidell evacuee e-mails/phones residents who stayed to find out when it is safe to come home.

2000). For instance, ICT pushes (sends/provides); demand (information need) pulls. Information is generally provided by ICT gatekeepers who try to anticipate what will be requested. Residents choose ICT to meet their information needs because it is often more convenient than making or waiting for an opportunity to meet face-to-face with someone they trust to provide accurate information.

After Katrina, many were not only forced to scavenge for food, water, and shelter; but also to scavenge for information about the condition of their families, friends, and property. They had no way of reaching family and friends outside Slidell—and their families and friends could not contact them. The thriving areas of Slidell entered an information poverty spell that would linger for months. During the first week after Katrina, residents who stayed or returned after evacuating made adjustments to their ordinary information behavior. They had no choice but to trust word-of-mouth from strangers or acquaintances. They could not access trusted sources for postdisaster information without phones, television, or Internet.

The postdisaster information needs of these once information-rich, now information-poor residents was somewhat dependent on whether they stayed, stayed and required rescue, evacuated and returned in a few days or weeks, or evacuated and could not return because of the extent of the damage to their property. However, by all accounts, those who stayed or evacuated, sustained extensive damage or not, were most interested in knowing the status of ICT so that they could learn the location and status of family, friends, and pets.

Slidell Residents Who Weathered the Storm

Most who stayed in Slidell were long-time residents who did not want to leave their property unprotected and did not believe the water would rise above their rooftops. Experience had taught them that the city authorities did not have the time or personnel to watch every person's property—and they knew they would be prevented from re-entering Slidell for several days. When the water rushed in, they were forced to move upstairs, into their attics, or climb to their roofs and wait for rescue and transport to shelter in Slidell or nearby communities.

Most had bought or retrieved stored generators for auxiliary power. They had also stored food and water in top shelves of cabinets and closets as soon as they learned that Katrina was heading toward New Orleans. Most thought to take axes, food, and water, and their frightened pets. Some thought to put up medicines, paper records, ICT devices, clothing, and toiletries. However, few had taken time to put up keepsakes.

Major Postdisaster Information Needs

Those who stayed were desperate to know when and if their ICT services would be restored so they could use technology to get information about the status of their family and friends. They also wanted to let their friends and family know they had survived. Those whose homes were uninhabitable needed to know how long they would be in shelters. Those whose homes were inhabitable needed to know when their utilities would be restored. All needed to know if their places of employment or schools were intact. They needed to know if they still had a job or business or classes to attend. They needed to know when FEMA would arrive to discuss government aid. They needed to know if and when their automobile insurance agents would supply compensation or replacement automobiles. They needed to know how to contact doctors and pharmacies that supplied prescription medications. For days, they would not find any of their needed information.

Postdisaster Information Behaviors

Some residents who stayed resorted to transistor radios to find where temporary food and water supplies were being distributed. They had no ICT to call or e-mail and no clear roads to travel to city offices or libraries where they might find information. Travel out of the neighborhoods was impossible except on foot toward higher ground after the water began to recede. At least one person waded through muck and rubble 36 hours, climbed over mountains of debris, and avoided a police barricade to make sure his grandmother was safe in her home. Others discovered that text messaging worked part of the time. Many asked neighbors, and even strangers, if they knew the status of family and friends. Many received inaccurate information as a result. Unfortunately, it would be several days or longer before most were able to receive accurate information about their family and friends.

Slidell Residents Who Evacuated

The report that Katrina could hit landfall as a Category 5 hurricane compelled many Slidell residents to evacuate. It was later calculated that the storm hit landfall as a Category 3 or possibly 4 on the Saffir-Simpson Damage-Potential Scale. However, the collapse of the New Orleans levee caused Slidell to take a greater than 20-foot storm surge from Lake Ponchartrain. Slidell was also subject to sustained Category 5 winds.

Most who evacuated and returned packed a few items of clothing, toiletries, and prescription medications and fled. Most returned to find that they had lost everything except the items they had taken when they evacuated.

TABLE 5: Slidell Hurricane Damage Weblogs: Samples of Conflicting Messages from August 30–September 8, 2005

Message	Conflicting Message
Hospital Reports Seem to Be True: (Tuesday, August 30, 2005) I've heard all morning from several sources that Slidell Memorial Hospital had a good deal of water in it. Someone said 9 feet of water (Oberkirch 2005).	Report on Slidell Memorial Hospital: (Thursday, September 1, 2005) We got into Slidell Tuesday morning. We parked behind the hospital and walked to our house on Maine Avenue. Everything looked fine at the hospital. There were people outside and I could hear generators running (Oberkirch 2005).
(Tuesday, August 30, 2005) Slidell Memorial Hospital has collapsed and they have not found any survivors (Electric Mist 2005).	(Thursday, September 8, 2005) Response to Blog 2: Slidell Memorial has NOT COLLAPSED! ALL IS WELL! The hospital sustained some roof damage [sic], but no signifigant [sic] structural damage [sic]. I know this because I work at SMH, and I am currently typing this thread on a nursing station at the hospital. PLEASE DO NOT SPREAD THE RUMOR THAT THE HOSPITAL HAS COLLAPSED WITH NO SURVIVORS (Electric Mist 2005).
Water Tower Down? (Tuesday, August 30, 2005) We've heard reports from more than a few folks that the water tower may have been knocked down. One was word passed from a Slidell police officer (Oberkirch 2005).	Photo: Robert Road (Tuesday, September 6, 2005) Not sure how the rumor about the water tower got started, but, as you can see (photo of standing water tower), it was there when I drove by Sunday (Oberkirch 2005).
Florida Avenue Elementary? (Tuesday, August 30, 2005) We've heard all morning that Florida Avenue Elementary was destroyed. Several sources. Can someone confirm this (Oberkirch 2005)?	Reading, Writing, Revising: Florida Avenue Elememntary Stands? (Wednesday, August 31, 2005) Great news if true, but aggravating that we are getting bad news. This post from WWL forums says Florida Avenue Elementary is fine. Also, Florida Avenue Elementary is fine. They walked around it today. There was not any water in it (Oberkirch 2005).

Like those who stayed, their first concern was finding a way to learn about other family and friends and letting their family and friends know they had survived. Because they usually had ICT services where they had been evacuated to, they spent days calling other Slidell residents who stayed or who evacuated to sites closer to Slidell. However, most of southern Louisiana could not receive cell phone calls because towers were down. After a few days, evacuees tried text-messaging and reached some residents who had cell phones. They also poured over Weblogs and Internet news sites for hours, searching frantically for any information about Slidell. Much of the information on the Internet was found to be inaccurate (see Table 5). Frustrated and fearful, many decided to return to Slidell before city officials opened the city. Lack of information drove these law-abiding citizens to bypass the law and re-enter their neighborhoods. Some parked outside restricted areas, waited until dark, then waded or canoed to their homes.

Many found they had lost everything: all of their household goods, furnishings, and clothing. Most had money to replenish at least some items, but they did not know where to purchase them. Major department stores were closed indefinitely. New Orleans was devastated and the closest city not hit by Katrina was Baton Rouge, 81 miles west and packed with evacuees. Returning evacuees were desperate to know the availability of food, clothing, and household items. Like those who stayed, they also needed to know about their work places and schools, FEMA aid, insurance claims, healthcare, and ICT in Slidell.



FIGURE 3: Make-shift sign posted on the parking lot of Slidell's Walmart where FEMA was distributing free food, water, and ice. Photo taken September 14, 2005 by Tisha Slagle Pipes.

Ironically, some postdisaster information they needed existed, but was not easily accessible or necessarily applicable when they did encounter it. Cardboard or plywood road signs, scrawled with markers (see Figure 3), directed residents to meals, water, and ice supplied by the government or private organizations; American Red Cross stations; debris removal services; and free roof tarps provided by FEMA's Operation Blue Roof. Ironically, FEMA's Operation Blue Roof website posted the following notice on the

Table 6: Slidell Postdisaster Information (On City of Slidell website, but unavailable to residents)

September 1	· No water, food, gasoline, electricity, or phone. · All schools are closed. · One thousand Cleco (Slidell's Electric Service Provider) workers arrived in Slidell to begin repairing damaged power lines. · There is currently only one location in Slidell that has fuel available, and the wait time for that has been up to six hours. Beyond Slidell, the nearest known availability of fuel west of Slidell is in Baton Rouge, and it is unknown at this time where the nearest available fuel can be located east of Slidell.
September 2	· Citizens are instructed not to come back into Slidell or the parish of St. Tammany. · The Causeway is open only to emergency traffic and the I-10 Twin Spans are heavily damaged and closed for the foreseeable future. There is no access to Orleans, Jefferson, St. Bernard, or Plaquemines—or any other south shore parish—through St. Tammany.
September 4	· All streets in Slidell are now passable, not clean, but vehicles are able to pass. · Some water service is available, but it is not drinkable; must be boiled 2–5 minutes before drinking. · Still no electricity, no gas, no food. · Water service is now operational and the drinking water in the City of Slidell is safe to drink and cook with. You do not need to boil your water first.
September 5	· All bridges over Lake Pontchartrain are closed until further notice. · For help locating missing persons, phone 1-866-GET-INFO (438-4636) or 1-877-LOVED1S (568-3317). · The Baton Rouge Chamber of Commerce has established a website to assist evacuated employees in contacting their employers. The site is http://www.findyourneworleansemployer.com
September 8	· First Baptist Church, located on Ponchartrain Drive has free meals, water, ice, clothing, and household goods.

September 10	· Post office begins limited delivery. · Sewer system is now operational. · Telephone (hard-line) service is now operational. · Charter Communications (television and Internet) has still not recovered. · A medical facility is now available in the vacant lot next to Starbuck's on Front Street. Doctors and nurses from across the nation are available to help the citizens of Slidell. · Northshore High School is now designated as a Red Cross Shelter. · The Slidell Office of Animal Control is currently housing over 400 pets displaced by the hurricane at the Public Operations building. If your pet is there, please pick up your pet as soon as you can. They are also giving out free dog and cat food. · Feeding locations are open throughout the city including First Baptist Church on Pontchartrain Drive, Harvest Church in the John Jay Shopping Center, Grace Memorial Church on Pearl Street, and the vacant lot next to Starbuck's on Front Street. FEMA is handing out ice, water, and MREs at the old Wal-Mart on Gause Boulevard and I-10. · St. Tammany Parish schools have a target date of October 3 to reopen. · Many stores have reopened including Wal-Mart, Home Depot, Lowe's, Sam's, and some grocery stores. Restaurants are also beginning to reopen. · Banks have reopened, including Hibernia, Whitney, Parish, and CPB.
September 12	· Water deemed safe to drink in all areas of Slidell. · Electric service is restored throughout Slidell except for areas hit hardest by the storm.
September 13	· Library to open September 15; will have Internet access for FEMA claims. · Charter Communications (television and Internet) is still down.
September 14	· FEMA officials have advised the City of Slidell that they will be available to assist citizens with the filing of FEMA claims on Thursday, September 15, from 10 a.m. to 4 p.m. at Northshore High School, 100 Panther Drive in Slidell.

Source: City of Slidell, Louisiana, Website, News & Announcements (Morris 2005).

FEMA website: "Homeowners can also cover their roof with free tarps provided by FEMA and issued through their local governments. Residents need to monitor the media for information on where to pick up the tarps" (FEMA 2005). Sadly, Slidell residents had no media to monitor.

The local radio stations broadcasted needed postdisaster information, but only those with transistor radios heard it. Slidell's mayor posted Katrina updates to Slidell's city website (see Table 6), but no one could view it because the website was down. Information was ubiquitous. Unfortunately, it was virtually inaccessible and inapplicable.

Conclusions

ICT exists to satisfy all levels of human needs identified by Maslow (Figure 1). It also exists to support entities that create products to satisfy life-sustaining needs (Gaines 1987). Physiological needs are supported by the agriculture, energy, and housing industries—and all of these industries rely on ICT for the development, maintenance, and management of their organizations. Safety needs are supported by public, medical, military, and legal agencies—and all of these agencies rely on ICT for communications, decision making, and command systems. Social needs are supported by communications providers, as well as religious, political, and entertainment organizations—and all of these organizations rely on ICT to develop communications and support social activities through telephone, electronic e-mail, discussion boards, and gaming. When Katrina destroyed Slidell's ICT infrastructure, postdisaster information became inaccessible and inapplicable. This recession of information tipped Slidell's usual abundant information flow into unexpected and unprecedented information poverty spell. Beset by two major barriers—inaccessibility and inapplicability of information—the residents were forced to create alternative methods for finding postdisaster information.

Those who stayed, or evacuated and returned, formed ad hoc social networks among neighbors they hardly knew or did not know at all. They spray-painted messages on their homes instead of using the phone. They waved for help instead of picking up the cell phone. They shouted to strangers instead of tuning in to the news. They waited for a passerby instead of checking their e-mail. They waded through debris instead of watching CNN. They searched for signage instead of browsing the Web. They hailed a ride with strangers instead of texting a friend. Some even canoed around police barriers and into their neighborhoods at night.

As a result of their new information behavior, they had to wait to receive information, wonder if it was accurate, and worry about how to find more information. Not only did they wait in long lines for water, ice, gasoline, groceries, household

items, and toiletries; but they also waited for information they desperately needed. When would the insurance adjuster appraise their loss? How could they contact the police about a vandalized car? How could they access their bank records? Where could they go to have a cut stitched?

Not only did they face the hardship of rebuilding homes, losing lifelong possessions and keepsakes, but they also faced the hardship of not knowing the status of family, friends, pets, and homes. Not only did they endure the insecurities of financial and material loss, but they also endured the insecurities of not knowing the future of their jobs, their educational goals, and their healthcare. The lack of information seriously impaired the comfortable lifestyles and livelihoods previously enjoyed by these Slidell residents.

Information is fundamental for human fulfillment and survival. However, the value of information lies in its accessibility and applicability. Accessible, applicable information enables people to effectively identify problems and plan recovery. Inaccessible information is, of course, useless and, unfortunately, electronic information is quite vulnerable to destruction that renders it inaccessible. Interestingly, those who were not dependent on electronic information to communicate (did not have or seldom used cell phones, television, or Internet) seemed to adjust to the absence of ICT more quickly—perhaps because they are unaccustomed to the luxury of ICT and consequently oblivious, by choice, to many hardships triggered by its inaccessibility.

Recommendations

Perhaps researchers should try to determine to what degree people can safely depend on ICT to meet their information needs in postdisaster situations. If information scientists and disaster scientists collaborate to learn how typical postdisaster information behavior dependent on ICT may intensify information disasters and the possibility of an information poverty spell, perhaps they can find ways to propagate some of the non-ICT methods used by past victims of disaster.

Non-ICT information sharing alternatives may also be identified and advocated for both victims and responders in disaster situations. Disaster managers could determine several possible physical locations to offer information, then inform responders and likely victims *before* another major disaster how, when, and where the nonelectronic information will be available. Possibly, helicopters that distribute food and water could be used later to carry billboards with locations of FEMA, shelters, meals, and so on.

Predisaster Possibilities

A sensitive information exchange technology that allows information to be displayed on heterogeneous networks across the world could eventually enable people to receive predisaster information: at home with their PDAs or cell phones, in the supermarket, in the bank or using the ATM, in their automobile, in the library, or hiking in the mountains (RAINS-Gauge 2004). On March 29, 2004, RAINS (Regional Alliances for Infrastructure and Network Security) introduced an open standards specification for safe sharing of sensitive information during crises like natural disasters. RAINS, a coalition of technology organizations and government agencies, developed and implemented OSIS (Open Specification for Sensitive Information Sharing) originally for Portland, Oregon's Connect & Protect.

OSIS has the potential to make people safer, healthier, and knowledgeable—chief rationales for embracing ICT for disaster warning and mitigation. However, sharing information through complicated networks (Stephenson and Anderson 1997), even those touted as "highly survivable," increases the likelihood of ICT disasters (Quarantelli 1997). Further, most U.S. communities, like Slidell, do not have access to a program like OSIS. The community's first responders do use an interoperable satellite system to communicate. Unfortunately, Slidell's satellite system was down the first three days following Katrina.

Is Technology the Answer?

Technology is *know-how*—the conversion of conscious thought into practical use. People used know-how to extend fingers into pencils, feet into wheels, and minds into computers. ICT is the ultimate know-how—it facilitates work, improves healthcare, increases learning, preserves records, and engenders creativity. However, two questions arise when analyzing the value of ICT: "Why shouldn't we use it if we can?" versus "Should we use it just because we can?" The "why shouldn't we" proponents proclaim that people who inhibit free invention ultimately prevent their own prosperity. The "should we" proponents proclaim that people who embrace free invention devise their own demise. People may indeed have fallen victim to their own technology (Joy 2000) in the case of Katrina where ICT disasters prolonged the deprivation of postdisaster information and, at least partially, caused an information poverty spell. Perhaps, then, it is true that a person's "technical prowess . . . [may] run ahead of his [or her] ability to deal with and profit from it" (Mesthene 2003). If technological determinism, a belief that technology drives society with a "logic of its own" (Heilbroner 1967) is true, then it might explain why people become slaves to devices driven by ICT. This seeming personification of technology may also explain society's enduring attraction to it. ICT is especially alluring—people clamor to purchase the latest ICT gadget and eventually become dependent on it to communicate. Interestingly, there are some

scientists—not science fictionists—who believe the extension of human intellect may cause computer systems to evolve into sentient beasts (Joy 2000)—perhaps the tiger that prevents dismount! Others believe that people may be able to use the same intellect that begot the beast to establish guidelines and safeguards to control it (Joy 2000; Mesthene 2003). Yet if ICT, empowered by its own logic, drives society to use it in spite of its vulnerability to disaster, then perhaps controlling it is too complex a task. Scientists do perform extensive laboratory testing to ensure that ICT can be controlled. However, the possible repercussions of embracing new ICT cannot truly be tested except through real, repeated use—and ironically, massive use of ICT exacerbates information disasters (Quarantelli 1997), as in the case of Katrina in Slidell. Controlling the repercussions of ICT may be as difficult as capturing and containing the imagination. Probably impossible.

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Voices from the Astrodome and Beyond: Counternarrative Accounts of Disaster

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Abstract

In the wake of a disaster victims and their families often struggle to regain control over their life and assign meaning to the event. One way to uncover this meaning-making process is to examine survivors' narrative accounts. In some instances, such as "man-made" disasters, these accounts can take the form of counternarratives, which challenge the official accounts offered by officials and the media. The author examines the counternarratives of Hurricane Katrina evacuees regarding the flooding of New Orleans as recorded in the Houston Astrodome and at other locations. Although the epistemological status of the accounts is in question, the author argues that they are nevertheless important to record because they should be preserved in the historical narrative. Moreover, they provide valuable insights into the structure of the social order as well as some insight into the evacuees' perception of race relations. These accounts also foreshadow the political contestation of the recovery and rebuilding process in New Orleans.

Keywords: evacuees, counternarratives, disasters, Hurricane Katrina, New Orleans

In my graduate seminar on disasters, I employ the 1927 Mississippi Flood as a case history and I often lament to my students that it is unfortunate that we do not have the flood survivors' narrative accounts, especially those who were arguably most harmed by the disaster: the African American population. Over the years I have depended primarily on blues recordings to give voice to the silent experience of those whose voices went unrecorded. Thus, my initial response to the tragedy of Hurricane Katrina was a determination to ensure that narrative accounts of evacuees of all ethnic backgrounds be recorded. I view these narrative accounts as perishable information that needs to be preserved. It is with this sense of urgency that in the days immediately following Hurricane Katrina. I flew to Houston, Texas, with two former graduate students and spent approximately a week interviewing evacuees in the Astrodome/Reliant Center complex. We interviewed evacuees while sitting on their cots and/or sharing their tables in the cafeterias, in other words in a direct, informal environment as events were unfolding. This initial research was then supplemented with a week in Houma, Louisiana, and an additional week in Austin, Texas, conducting in-depth interviews with evacuees. In these later field trips, in November 2005 and February 2006 respectively, graduate students and I interviewed evacuees living in temporary housing situations such as motels and apartments. The same semiformal methods used originally in the Houston Astrodome were also employed in this later research.

Methods

In-depth, semiformal interviews were conducted by me and graduate students to document victims' experiences with the disaster and in the Astrodome. Evacuees who were previously in the Superdome or the Convention Center, or other shelters, were also interviewed about their experiences. The interviews were audio-recorded and, in some instances, were video-taped. We utilized convenience sampling to identify informants. The quantitative and qualitative data gathered seeks to record the evacuees' personal accounts of the disaster, as well as capture information about both their met and unmet needs. Survey interviews lasted anywhere from one-half hour to an hour or more. Nine out of 10 evacuees approached agreed to be interviewed. This initial research was used in a proposal for followup research with evacuees in other locations in the Gulf states. Additional funding for the continuation of the project was provided by the University of Michigan's Health Preparedness Center. This research is ongoing. Preliminary findings are based, to date, on 179 in-depth interviews, of which 92 evacuees are adult men and 87 are adult women over the age of 18. Eighty percent of the evacuees interviewed were African American, 12 percent white, and the remainder Native American and/or mixed ancestry. Approximately 81 percent of the interviewees reported having pre-Katrina incomes of $28,000 or less. Seventy-

one percent of the evacuees rated the adequacy of the flood warnings on a scale of 1 to 5 as being 2 or less.

To date we have gathered data on a variety of issues too extensive to summarize within the confines of this chapter. Instead, I have chosen to focus exclusively on the counternarratives of the evacuees and, in particular, the narrative accounts of the flooding that occurred as the result of the levee failures in New Orleans. These counternarratives not only challenge the official accounts of the cause of the flooding (which proved to be so devastating and lethal) but present problematic claims that radically call into question the facts as we know them. Regardless of their epistemological status, I argue the importance of such accounts to our understanding of the events surrounding Katrina and disaster research in general.

Overview

In the wake of a disaster people, in an attempt to regain control of their lives, struggle to make sense of the world and assign meaning to the event. Survivors need to interpret the disaster event in order to negotiate, manage, and comprehend their experiences. They locate the disaster within a set of cultural logistics that enables them to understand what happened and why (Wallace 1957; Becker 1997).

Victims and their families struggle in the wake of disaster not only to regain control of their lives, but also to refute the "objective" frames of the disaster offered by the media and official government accounts. Often the authorities' frustrating failure to prevent disasters or their ineptitude in responding to them causes people to question the social order. Disaster victims ask such questions as "Why me?" "Why here? "Why didn't the government prevent this from happening?" "Why aren't people being held accountable?" In the wake of a technological disaster the assignment of blame and responsibility often becomes an integral part of this struggle to find meaning (Barton 1970; Bucher 1957; Baum, Fleming, and Davidson 1983; Button 1990; Drabek and Quarantelli 1967).

As one evacuee in the Houston Astrodome stated, "the news don't tell you everything." In Austin, Texas, another evacuee asserted, "the media tells what it wants to tell." Many of the evacuees interviewed stated at the onset of the interviews that the primary reason they wanted to participate in the survey was to be sure "their stories" were told and not forgotten or misrepresented in the media or by politicians. An evacuee in Houma, Louisiana, stressed the need to record her account because "we are the forgotten people and if we don't tell our story we will continue to be forgotten." Yet another evacuee in Houston pronounced, "there is value in telling our story so that people never forget what they done to us." An elderly women evacuee stated that "politicians get their voices heard whereas we don't; it's that simple."

Whether labeled "natural" or "technological," disaster events highlight ongoing power struggles in society. The control of information in the media or in the public discourse, as well as the attempt to define meaning, is an attempt to define reality in accordance with a favored political agenda and therefore must be seen as a distinctly ideological process. This struggle becomes especially pronounced in the wake of a technological disaster such as the flooding of New Orleans. The framing process both constructs and reconstructs meaning in a selective manner that legitimizes some accounts while obscuring others. In the contestation over the meaning of a disaster the victims' voices are often muted or excluded. The struggle to assert counternarratives is an enduring theme of man-made disasters in recent times. (Molotch 1972; Levine 1982; Eggington 1980; Reich 1991; Edelstein 1988; Stephens 2001; Button 1995, 1999, 2001).

It makes a crucial difference whose interpretations are heard in the aftermath of a disaster and whose interpretations are excluded (Button 1995). The outcome of important questions, such as who is to blame, who is to be compensated, who suffers disproportionate risk exposure, and who should be involved in essential decision making such as remedial treatment, and what constitutes a sustainable recovery, all pivot on whose voices are heard.

One way to uncover this meaning-making process is to examine people's narrative accounts of their experience. As Becker (1997) notes, "Viewed as the practice of everyday life, a narrative can provide us with important insights into people's experiences and their perspective on them." Narratives are also, as Carr has observed, empowering; they represent action and agency (1986). Moreover, as White has suggested, narratives, "are intimately related to, if not a function of, the impulse to moralize reality" (1981). Narratives of disasters are also particularly potent domains in which to explore the legitimation and reproduction of power.

Counternarratives

As in the case of Hurricane Katrina evacuees, in the wake of controversy narrative accounts can take the form of counternarratives that attempt to offset the discourse of government officials and media coverage of the event. Counternarratives become rhetorical tools for making claims. While the counternarratives are articulated individually they have shared cultural meaning as the narrative coherence of the Katrina evacuees demonstrate.

There were many counternarratives expressed by the evacuees. There were common complaints that evacuees who were stranded on their rooftops for days were ignored by rescue workers. Stories of people being forcibly separated from loved ones as they were bused out of "harms way" were also common. Many complained

of having been treated as second-class citizens, both in their communities of origin and in the shelters and convention centers. Scores of evacuees complained of having "loaded weapons" with "fingers on the trigger" pointed at them in the shelters, on the highway overpasses, and while boarding buses. Many also complained about being forced to drop their small plastic bag of possessions as they were rescued or boarded buses. Bags that contained irreplaceable mementoes like photos of dead relatives and various forms of identification. Others told stories of being forced to turn back, at gunpoint, from the bridge entering Gretna in Jefferson Parish. Some insisted that the military cut off the electrical power to the city to drive out African Americans. There were also complaints of being abandoned for days on highway overpasses without food or water. Some made the analogy that their bus or plane journey to out-of-state shelters was like being on the slave ships that transported their ancestors to America.

Still others complained that while the conditions in shelters in Houston or San Antonio were better than in the Superdome, restrictions of evacuees' activities (in contradistinction to the shelter staff and volunteers) and shelter curfews compared to concentration camps. There were also evacuees that claimed the authorities were trying to force them out of the Astrodome before they received the aid they had been promised. One elderly women in the Astrodome, complaining about being among a group of people who were forcibly moved—with no explanation—in the middle of the night, from one sports arena to another, said it awakened her fears of being taken to "the showers" (referring to Nazi concentration camp tactics).

Perhaps, the most intriguing and confounding counternarratives were the ones about the levees in New Orleans being intentionally destroyed. They are on one level perplexing because they seem to strain the credulity of the teller and to some listeners are most at odds with the apparent facts of the event. Lest the reader think this is too farfetched an idea that someone would intentionally cause a flood, it has been reported that in the early hours of the breach of the Mississippi River Gulf Outlet (MRGO) the Army Corps of Engineers believed the failure of MRGO could only be attributable to sabotage (Freudenberg 2006).

The conspiratorial theme that the whites created the flood in order to reclaim the city pervades all of these flood narratives. This is an interesting theme since apart from the flood narratives; the theme of whites trying to regain control of the city and thwart the return of African Americans was probably the dominant theme of political discourse in New Orleans during the recovery period. Thus the flood narratives, whatever their truth status, were predictive of what was to emerge as a central political concern.

While the above-mentioned narratives are at odds with some "official" accounts of events surrounding the disaster, this particular counternarrative seems to be most counterfactual and implausible to many outside observers. This skepticism challenges the researcher to "make sense" of such accounts and the claims-making activities of the narrators. For one thing, although some of the other counternarratives related above were reported to varying degrees in the media, especially, for example, law enforcement officials' armed resistance to evacuees entering Jefferson Parish, the stories about the blowing up of the levees were not widely reported. Thus there is a tendency to relegate these claims to the realm of folklore, urban myth, rumor, or just plain paranoia, and dismiss them as valid narrative accounts.

For a majority of the narrators, the flooding of New Orleans and not Hurricane Katrina proved to be the focal event. Richard C. Thomas, an African American, New Orleans artist whose great murals decorate the Louis Armstrong Airport, refers to it as "The Great Flood of New Orleans," and has been commissioned to paint a large mural on the subject based on a painting of the same name he executed shortly after the flood. According to the artist, whom we interviewed, the title is not his, but is derived from the local way people refer to the event.

"We know they blowed the levees," stated one older African American male evacuee in Austin. Another middle-aged male stated quite unequivocally, "I know they had some people who blew it [the levee by the Industrial Canal]. Another African American evacuee proclaimed, "I heard three booms and saw three flashes before the water rushed in." "They tried to kill us," one young woman protested. A 59-year-old African American man said: "People where I live feel like if they wouldn't have blown the levees, then we wouldn'ta got flooded out. Because the hurricane didn't do that much damage."

In the words of a 57-year-old African American male: "Hearing that explosion on the levee, I'll never forget that. I saw the flash, I heard the boom. I'll never forget that . . . They [whites] want to come to New Orleans and felt like here is our chance to come back. We're going to flood out everything, and we're going to sell their property, and we're going to buy it back and get back New Orleans."

"FEMA broke the Seventh Avenue levee intentionally," stated an elderly African American woman. A 33-year-old African American woman in Austin argued that "they" blew up levees to protect the French Quarter, to save the area for tourism: "I just think it's kinda messed up. We were fucked. There's nothing we could do. That's how I feel about it. I really think they blew up the levee just so they could save that area, so they could save the tourist attraction. Fuck us. 'We need money

for the city; let's flood the Lower Ninth Ward and Seventh Ward. Maybe we could do that and save French Quarter.'"

In an effort to make sense of the above statements we first need to locate them in a sociohistorical context. Historians Pete Daniel (1977) and John Barry (1997) both recount how, during the Great Mississippi flood of 1927, the white fathers of New Orleans obtained permission from the federal government to blow up a levee downriver from the city. The explosion flooded both St. Bernard and Plaquemines Parish and destroyed the homes and livelihoods of thousands of marginalized people who never received the compensation they were promised. This story has not been lost on at least some of the evacuees. A 90-year-old evacuee in the Houston Astrodome reminded me of the tragedy and argued "if they would do it once, they would do it again."

Many more evacuees invoked the same tale in recounting Hurricane Betsy. Survivors of Hurricanes Betsy and Katrina made comparisons with the flooding then, including the belief that both floods were due to the intentional destruction of the levees. "You would have to be stupid to not make the connection between all these events," argued one middle-aged black woman. "They're still treating us now the same as then," she concluded.

Outside of the formal interview process it was not uncommon to hear similar allegations about the "real" cause of the flood. In one-on-one informal conversations and in some evacuee group discussions it was commonly argued that the flooding was caused by the intentional destruction of the levees. Outside an apartment complex in Austin, Texas, a group of evacuees comprising different age groups were talking about the levees having been blown up by "officials." As all listened in agreement, one young man expressed the following: "I'd seen the boats, in the dark, go right up to the levee and kind of hang around a bit. When that boat left and was a good distance away the levee blew. You can't tell me they didn't cause the flooding. I saw it happen." This evacuee is among a half-dozen people who claim to have actually witnessed the blowing up of the levees. These "eyewitness" accounts, in some people's minds, serve to add a level of credibility. Such stories have been dismissed by many as being implausible, fictional, or misinformed. Witness the explanation offered by Jim Amoss, editor of the *Times-Picayune*:

> *Perception is reality, and their reality is terrible. We are talking about people who are very poor and have a precondition to accept this belief. Lots of them are cut off from mainstream news and information. They are isolated in shelters and they know a thing or two about victimization. It fits well into a system of belief (Remnick 2005).*

It is an interesting statement on many levels and appears to make a commonsensical explanation for the "erroneous" belief that the flood was the result of some sort of conspiracy. Some scholars do argue that such counternarratives are, "credible because they reinforce the world view of those who share them," (Fine and Turner 2001). Amoss's remarks, however, among other things, do not explain why other residents whose reality may not be so "terrible" may also adhere to a similar explanation.

While conducting research on another, unrelated, Katrina project, I encountered some evacuees from St. Bernard Parish (a predominately white parish) who subscribed to the same theory, albeit they were white and may or may not "know a thing or two about victimization." They were, however, residents of one of the two parishes that were "sacrificed" in the dynamiting of the Caernarvon levee in 1927. One well-educated man, whose family had lived in the parish for 250 years, stated that it was "only reasonable to conclude that the authorities resorted to the same tactics as they did in the twenties." A woman from another household offered the theory that "they blew up the levees to get rid of the colored folks and it got out of control and damaged St. Bernard Parish." One thing about both groups of evacuees that does hold true is that, having left the shelters some time ago, they are no longer removed from access to mainstream news, and yet they persist in perceiving the flood in a different light than the official media accounts.

In examining these accounts we must ask, as White (1984) has asked, what kind of insight do such counternarratives give to the nature of real events? What is their significance and role in documenting the evacuees' narratives? Does the veracity of these accounts matter? And, if so, in what way? Is there a thin line between history and fiction in narrative accounts? Are these counternarratives to be dismissed as mere rumor?

Undoubtedly, the assertion that the survivors of Hurricane Katrina "know a thing or two about victimization" is relevant to the perception that the levees were intentionally destroyed given the sharply etched race and class issues surrounding the event. Along with these issues there is another relevant topic that emerged during the research process. Most evacuees rated the official hurricane warnings as highly accurate. In contrast, most evacuees, especially African Americans, rated the flood warnings very low. When asked to rank the accuracy of the flood warning on a scale of 1 to 5, it was not uncommon for the respondents to insist on zero or some number minus zero. When encouraged to select a number on the Likert Scale the majority responded "1" or "2" and most often continued to protest vehemently that there was no warning. The perception that there was no warning reinforced the general notion that the flood was the result of a conspiracy. "Otherwise, they would have warned us," is a response many gave. The common perception

that the hurricane warnings were adequate is held in sharp contrast to the fact that the warnings of the flood were perceived as grossly inadequate and were therefore equated with surreptitiousness.

While the *Times-Picayune* editor's explanation for the belief that the destruction of the levees was a deliberate act rests on a history of "victimization" it does not go as far as other explanations that compare this belief to other conspiratorial theories that have circulated in some Afro-American communities: that whites introduced crack into African American communities in order to destabilize them or that the federal government developed AIDS in order to kill off gays and blacks. Are such counternarratives merely rumors generated by a "pathology" of culture or should we view them as Bridgette Davis suggests in a Boston Globe article (December 15, 1996):

> *I think the history of any oppressed people demands you never assume anything is impossible. I come to these issues with a particular history, as a person of color. I would never be so presumptuous as to dismiss all rumors as paranoia. The paranoia comes out of a context not a vacuum.*

The context some suggest is, for instance, the entire history of slavery, the Tuskegee experiments in which black men were used as guinea pigs to study the effects of syphilis, and the FBI persecution of civil rights leaders. Within some sectors of the African American community, it seems certain that Hurricane Katrina will be included in this litany of injustice.

What kind of insight these counternarratives provide us about real events must also be seen in the ongoing struggle in the wake of disasters between lay versus professional explanatory frames in which this powerful dichotomy, more often than not, excludes the voices of individuals and also ignores communities and their historical and cultural experiences (Kroll-Smith and Floyd 1997; Button 2001). As Brown and Mikkelsen (1990) have noted, this privileging of the professional voice has led to, "a high degree of information control." In this instance, the tension is ultimately manifested in the struggle between lay individuals and historians for the official account of the flood. In the words of Trouillot (1995), the potential dismissal of the discursive flood accounts risks these narratives being reduced to "bundles of silence." The silencing of the experiences and voices of the flood survivors can only ensure the continuation of what Wolf (1982) refers to as "a people without history." Finally, as Hewitt argues:

> *[It is important] to pay close attention to what they [disaster survivors] say, their story and concerns give them direct entry into the concepts and discussions of social and disaster research. This is an essential step*

toward giving those who do not get published some participation in and control over the impersonal processes and citadels of expertise that tend to dominate the disaster community (1998).

Conclusion

The underlying cultural logic of mainstream narratives tends to reinforce the hegemonic forces of our society (Iyengar 1991) whereas the counternarratives of the evacuees are privileged sites by which to examine the social order (Briggs 1996). These narratives are lenses by which we can examine the perceptions of those disproportionately affected by the disaster. Such narrative accounts can also provide us with a deeper understanding about some of the survivors' views about race relations and the government's response to the catastrophe. Regardless of whether we think of them as a convoluted mix of explanatory conspiracy theories or as fact, we cannot ignore them or fail to record their significance. The recording and archiving of counternarratives allows for, if nothing else, a historiography of alterity.

We also ignore such accounts at our own risk since they provide us with valuable feedback and insight about the structure of our social order as well as potential lessons learned about what constitutes an effective disaster response (if in no other sense than the failure of an effective crisis communication network to warn of the flooding). Whether we take the flood accounts literally or not, woven into these accounts is a deeper text of meaning about race relations that cannot be ignored. Indeed, the present contestation over the control of the recovery process and the future of New Orleans was foreshadowed in these flood narratives. The underlying core theme of whether New Orleans will remain a largely African American city or be "taken back" by the white fathers is the cultural logic on which the flood narrative rests. Whether you choose to reject or accept the claim that the levies were intentionally destroyed this portion of the flood narratives is revealing. In this sense, the flood narrative gives us insight into real events.

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Locally Influenced, Distantly Courageous? Exploring Media Constructions of Katrina's Gulf Coast Impacts

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Abstract

This study focuses on causal story constructions of the 2005 Hurricane Katrina disaster in five different print media: *The Economist* of London, the *New York Times*, the *Washington Post*, the *Mobile Register*, and the Biloxi *Sun Herald*. Our purpose was to explore whether the Katrina disaster was differentially constructed in the first 30 days after the event as a preparedness and response failure or as the result of more fundamental faulty land-use decisions—that is, allowing housing and other development in coastal regions prone to recurrent hurricane storm surge, flooding, and wind damage. Based on nondecision making, issue avoidance, and agenda control literatures, the working hypothesis was that the Katrina disaster would be overwhelmingly defined in local media as the result of technical or organizational problems and not from flaws in the basic development or "growth model" of the region. Our findings suggest an interesting postdisaster rule: The farther a media outlet is from the arena where core mitigation decisions are made, the more willing it is to question dominant growth

models and raise fundamental wisdom failure questions. Conversely, the closer a media outlet is to the arena where core mitigation decisions are made, the less willing it is to question growth models and raise fundamental vulnerability issues, which then affects public discourse on reconstruction values and strategies. This rule, which we call the Distance-Courage Relationship, helps explain why local media are so loath to bring up major mitigation, especially land-use, issues while national and foreign media feel relatively freer to do so.

Keywords: agenda control, agenda setting, blame game, causal stories, media constructions

As Stone outlined in her now classic article (1989) and subsequent book, now revised (2001), about issues and agendas, causal stories are attempts to authoritatively define problems and thereby set the public parameters or groundwork for discussing possible solutions. That is, causal stories are frequently more about issue control than truth. Olson (2000, 266) then took this line of thinking into disaster research by noting that various postdisaster questions always politicize an extreme event, but one in particular: Why were the losses so high and/or the response so inadequate? In major disasters, this question tends to set off intense causal story competition.

Similar to earlier work on causal story construction of the 2003 southern California wildfires (Olson and Gawronski 2005), this study focuses on causal story construction of Hurricane Katrina along the U.S. Gulf Coast in five very different print media: *The Economist* of London, the *New York Times*, the *Washington Post*, the *Mobile Register*, and the Biloxi *Sun Herald*. We excluded New Orleans' *Times-Picayune* because that city's vulnerability was and remains unique.

Disasters as Constructed Events

Natural events, of course, are not necessarily disasters. Hazards such as earthquakes, tsunamis, volcanic eruptions, hurricanes, flooding, or even wildfires must interact with social systems and human vulnerability to become "disasters" (see Blaikie, Cannon, Davis, and Wisner 2003, and Oliver-Smith and Hoffmann 1999, among many others). While controversy continues over definitions and the parameters of the concept "disaster" (Quarantelli 1998; Perry and Quarantelli 2004), the hazard-vulnerability interaction is well enough accepted to serve as a basis for most research. Also very well accepted and beyond debate is the crucial role of the media in establishing, for the public at least, a natural event as a disaster.

Of course, the media quite often focuses on human interest stories in a disaster, but a more sensitive and less-covered issue is establishing the cause or causes of a disaster, for it is on that basis that blame is conventionally assigned, which all too often turns into scapegoating (Bucher 1957).

More important for analytic purposes, however, causal constructions of disasters quite often frame the solutions proffered to avoid their recurrence, which then affect the composition and priorities of items on policy agendas—systemic (or "public"), institutional, governmental, and decision making. That is, causal constructions of disasters or other extreme events are important components in answering Kingdon's (1995, 1) classic question: What makes people in and around government attend, at any given time, to some subjects and not others?

It is well established that the media plays an integral role in agenda setting, although disagreement exists about precisely how. The classic argument (McCombs and Shaw 1972) is that while the relationship is very clearly reciprocal, the media sets the systemic or public agenda more than vice versa. Manheim's (1986) model is more nuanced, however, in that the public, media, and policy agendas are interrelated and influence one another. That is, the causal arrow is reciprocal and exceedingly complex. But all of the various literatures recognize the role of catalyzing, focusing, or trigger events in capturing media attention and altering policy agendas. Some events are clear examples of triggers or focusing events and come to dominate the media while others might be much more subtle and less noticed publicly. The 2005 Hurricane Katrina disaster is an obvious example of the former.

With this in mind, we examined the Hurricane Katrina disaster along the Gulf Coast to determine the answer to one particular question: How did the local and the national media (and one British newsmagazine) construct its cause or causes? That is, was the Katrina disaster predominantly constructed as a failure of hazard reduction, mitigation, preparedness, and/or response, or was the disaster attributed to more fundamental land-use decisions—that is, allowing housing and other development to push into coastal regions prone to recurrent hurricane storm surge, flooding, and wind damage? In other words, was this disaster constructed as resulting more from a relatively "technical/organizational" set of deficiencies or as a more profound "wisdom failure?" We are driven by the concern that causally constructing disasters as primarily "fixable" problems might actually increase long-term vulnerability along the Gulf Coast.

The Event

Hurricane Katrina, the eleventh named storm and fifth named hurricane of the 2005 season, first formed over the Bahamas on August 23, 2005. Katrina crossed

southern Florida as a Category 1 hurricane on August 24, causing significant localized flood and wind damage and resulting in the death of seven people. As Katrina passed northward over the warmer waters of the Gulf of Mexico, however, she strengthened to Category 5 status and became the most intense hurricane ever recorded in the Gulf. As Katrina neared Louisiana she followed predictions and weakened to a Category 3. Then, with the eye wobbling slightly, Katrina turned to the east of New Orleans and made Louisiana landfall the morning of August 29, causing major or catastrophic damage along much of the Alabama, Mississippi, and Louisiana coasts. While Katrina will forever be known for the flooding of New Orleans, intense winds, storm surge, and widespread flooding caused major damage to the cities of Biloxi, Gulfport, and Mobile. With severe wind damage extending up to 100 miles inland, the disaster zone approximated the size of Great Britain.

For Hurricane Katrina, the National Weather Service and the National Hurricane Center's path predictions and forecasts were extraordinarily accurate and dovetailed with long-held expert worries about the Gulf Coast in general and New Orleans in particular. Indeed, New Orleans and much of the Gulf Coast were "disasters waiting to happen," and the New Orleans damage followed a scenario detailed in a Louisiana State University model that was the basis for a five-day simulation ("Hurricane Pam") practiced by more than 40 federal, state, local, and volunteer organizations over a year before Katrina hit. That simulation envisioned the destruction of a significant portion of New Orleans and the forced evacuation of one million people.

Given massive media coverage of the, at times, truly appalling response problems, the U.S. blame game was also intense and became extremely political. For example, without coming to any meaningful conclusions or proposing any workable solutions, the Select Bipartisan Committee of the U.S. House of Representative addressed the following highly charged items, as quoted directly from its final report, *A Failure of Initiative* (2006, ix):

1. Why situational awareness was so foggy, for so long.
2. Why all residents, especially the most helpless, were not evacuated more quickly.
3. Why supplies and equipment and support were so slow in arriving.
4. Why so much taxpayer money aimed at better preparing and protecting the Gulf Coast was left on the table, unspent or, in some cases, misspent.
5. Why the adequacy of preparation and response seemed to vary significantly from state to state, county to county, town to town.

6. Why unsubstantiated rumors and uncritically repeated press reports—at times fueled by top officials—were able to delay, disrupt, and diminish the response.
7. Why government at all levels failed to react more effectively to a storm that was predicted with unprecedented timeliness and accuracy.

Thus, to say that Hurricane Katrina became a political crisis for government officials at all levels would be an understatement, and it appears very clear that the response problems associated with Hurricane Katrina affected public confidence in the administration of George W. Bush and will affect at least the mid-term 2006 congressional elections and possibly the 2008 presidential election. Our interest, however, is much more modest and more focused: how the event was "causally constructed" in an elite foreign weekly magazine, the U.S. newspaper of record, the dominant paper in the nation's capital, and two local newspapers in the affected area.

The Working Hypothesis and Methodology

Mainstream local newspapers have to be very careful about offending local interests (after all, they have to appeal to their readers and sell newspapers), but national or extra-regional newspapers can be less sensitive, and foreign media are the least concerned. Based on the lack of decision making, issue avoidance, and agenda control literatures, our working hypothesis was that the Hurricane Katrina disaster would therefore be overwhelmingly defined in the local print media (the Biloxi *Sun Herald* and the *Mobile Register*) as resulting from technical/organizational problems and not from flaws in the basic extensive land development or "growth model" prevalent in the Gulf Coast region. That is, we hypothesized that local media would be attentive to growth model biases and would devote relatively little time and attention to causal stories exploring fundamental questions of hazard-sensitive land use and building standards in the affected areas. After all, the "We Will Rebuild" mantra is powerful, and there is much money to be made in reconstruction. Indeed, reconstruction is a component of the prevailing coastal development model because property values tend to rise after rebuilding, especially in areas that were in decline before the disaster and where development can attract significant investment.

In contrast, we expected that that the national newspapers (the *New York Times* and the *Washington Post*) and our one foreign media source (*The Economist*) would be more willing to question the coastal growth model and probe the associated wisdom failures. We also expected more stories in the national media covering the relationship between environmental degradation, loss of coastal wetlands, coastal erosion, and increasing vulnerabilities, which are all related to land use decisions.

While much has been written about the nature and importance of "causal stories" in politics and public policy analysis, methods for coding and analyzing such stories and then tracking their impacts through various political agendas to eventual outputs and outcomes are much weaker. As Van Belle (2000) and others studying the news media have noted, however, disasters or other uncommon events offer unusually clear opportunities to track issues because they minimize influences of confounding variables so often found in "normal" times. That is, disasters offer significant opportunities for testing models of causal story construction and agenda setting and control.

Causal story analysis in disaster research is relatively new and tends toward controversy, especially in postimpact communities or regions. Indeed, one academic colleague suggested that eschewing claims to the pursuit of objective truth and focusing instead on interest-driven causal story competitions, we may have found the third, electrified, rail of disaster research. Perhaps, but so be it. Human and property losses from disasters continue to mount, and someone may have to touch that third rail to open a public discussion of the wisdom of the dominant U.S. growth model, particularly along hurricane-prone coasts (but also in other hazard-prone, high-value real estate areas), and the degree to which, and to whom, the ensuing periodic disaster losses are "acceptable."

Finally, we fully recognize that our 30-day time limit on the media is too short for firm conclusions and that our methodology is a bit crude. While we are not simply counting stories and letting it go at that, neither are we conducting strict or sophisticated content analysis. Moreover, we are not measuring column length dedicated to a particular type of story or to a "causal attribution" but, rather, searching for treatments, long or short, banal or poignant, of why Hurricane Katrina became a great U.S. disaster. In the end, our goal is to stimulate more in-depth causal story research not only on Katrina, but on all disasters.

We identified potentially relevant articles through searches on the websites of each of the news sources and/or by collecting hard copies of the newspapers themselves. We then read each article for "causal attributions," which yielded a total of 592 from all newspapers, including the weekly newsmagazine *The Economist*, from approximately 3,000 stories mentioning Hurricane Katrina. We then coded an attribution as "1" if it focused on land use or building standard decisions that had rendered an area or a development in harm's way (we like to call these "wisdom failures"). We coded attributions "2" if they framed the disaster as resulting from relatively technical/mitigation failures (e.g., not maintaining levees, sea walls, or flood control systems), "3" if they primarily focused on organizational preparedness and response problems (e.g., inadequate equipment, poor training, communication and/or coordination gaps, jurisdictional problems). If an article managed

to cover various causal problems, we registered entries in all of the appropriate categories. That is, some articles received multiple entries ("1," "2," and "3"), a method used in Van Belle (1999), and we decided to keep any such unusually comprehensive stories in a special file for followup with the reporter and editor.

For our working hypothesis we expected a media bias for technical/mitigation and preparedness and response problems (a combination of our code "2" and code "3" causal attributions) as opposed to "wisdom failures" (code "1"), so we set a relatively high bar for its corroboration: a 5 to 1 ratio. That is, any causal construction ratio of less than 5:1 in technical/mitigation and preparedness and response failures to wisdom failures would find for the null hypothesis, indicating at least a somewhat broader or balanced causal treatment of the losses from the event.

Initial Findings

We decided to start farthest from the Gulf Coast region, with the British weekly newsmagazine *The Economist*, which has a fairly sophisticated readership, more than half of whom reside in the United States. We then turned to two newspapers with national readerships, the *New York Times* and the *Washington Post*, and then analytically moved into the region itself with two newspapers whose service areas were directly affected by Hurricane Katrina: the *Sun Herald* (Biloxi, Mississippi) and the *Mobile Register* (Mobile, Alabama). In fact, both newspapers were directly affected. The *Mobile Register* was forced to shut down its operations for approximately one week, but the *Sun Herald* determined to stay up and running and became "the little newspaper that could" and attracted its own media attention.

To reiterate an important limitation, we restricted the analysis to the first 30 days of post-Katrina coverage (with slightly different time windows for the local papers because of their physical damage). Table 1 presents the initial comparative findings by causal attribution numbers and by percentages.

Using our 5:1 (85 percent to 15 percent) threshold of a combined Code 2 and Code 3 to Code 1 ratio to corroborate our working hypothesis, the *Mobile Register* conforms (89 percent to 11 percent), as does—almost identically—the *Sun Herald* (88 percent to 12 percent). We were struck, however, by how few causal attributions of any type we could identify in the *Sun Herald*, but we think this can be explained by the very active role the *Sun Herald* played in the disaster. Out of 25 clearly identified causal attributions between August 27 and September 29, 2005, only three directly addressed land use problems or wisdom failures. The newspaper was too preoccupied with its societal role as a source of important, practical, and/or even vital life-saving information to engage in critical reflection or analysis of the Katrina disaster's causes, at least early on.

TABLE 1: Causal Attribution Comparisons by Totals and Percentages

Media Source	Code 1 Land Use/ Wisdom Failure	Code 2 Technical/ Mitigation	Code 3 Preparation/ Response	Total Causal Attributions
The Economist	5 36%	4 29%	5 36%	14
New York Times	73 25%	82 28%	137 47%	292
Washington Post	34 24%	33 23%	77 53%	144
Mobile Register	13 11%	30 26%	74 63%	117
Sun Herald	3 12%	6 24%	16 64%	25
Totals	131 22%	155 26%	309 52%	592

Similar to what we saw with the coverage and causal attribution profile of the Biloxi *Sun Herald* in the first month or so after Katrina's impact, the *Mobile Register* overwhelmingly focused on human interest and "where to find help" stories—that is, vital practical information. Causal attributions for the disaster were noticeably scarce (only 117 over the 30 days) but much more frequent than what was found in the *Sun Herald*. They were almost exclusively focused on federal (DHS/FEMA) response shortcomings. Not to put too fine a point on it, literally no one (including the newspaper staff itself) brought up or questioned the dominant coastal development model that has placed population and property within easy reach of possible storm surge and the most intense immediate impact wind fields. Again, to the extent that the media play a key role in setting the public agenda and focusing public discourse after a disaster, discussions of land use and building code wisdom failures were conspicuously absent in south coastal Alabama. Except in the case of the bizarrely unusual floating casinos in Mississippi, more effective hazard mitigation was simply not put on the public radar screen in the first month or so after Hurricane Katrina.

Although our national newspapers demonstrated more wisdom failure causal attributions than the local newspapers (by twice the percentage), they still focused

more heavily than expected on technical/mitigation and preparedness and response problems rather than on wisdom failures: a combined 76 percent to 24 percent for the *Washington Post* and a combined 75 percent to 25 percent for the *New York Times*. *The Economist* showed the most balanced treatment, in terms of the number of stories in each category, of the Hurricane Katrina disaster. We identified 58 stories mentioning Hurricane Katrina for the months of September and October, 2005, with only 14 causal attributions, 5 dealing with poor land use decisions or wisdom failures, and 9 treatments of technical/mitigation and preparedness or response problems, all of which gives us a slightly different ratio: a combined 64 percent to 36 percent. Of course, *The Economist*'s particular business, political-economy news focus comes through in the stories, and as expected, *The Economist* treated the Hurricane Katrina disaster as primarily a New Orleans disaster.

Challenging the Coastal Development Model

Indeed, several exemplary stories challenging the coastal development model appeared in the first 30 days or so after Hurricane Katrina's impact. Of course, we expected fewer human interest stories in *The Economist* because it provides mostly in-depth business and political news, which is not to say that only coldly analytic stories are found there. In fact, a great deal of sympathy was expressed by its editors, as consecutive covers of the magazine were chosen to evoke an emotional response: An inundated New Orleans was the cover for the September 3–9, 2005, issue, with the cover story "A city silenced, The consequences of Katrina," and a picture of a very distraught African American woman was the cover for the September 10–16, 2005, issue, with the cover story "The shaming of America." Nonetheless, the editors were quick to identify problems with land use (September 3–9, 2005, 11):

> For much of the 20th century the federal government tampered with the Mississippi, to help shipping and—ironically—prevent floods. In the process it destroyed some 1m acres of coastal marshland around New Orleans—something which suited property developers, but removed much of the city's natural protection against flooding. . . .
>
> If there are lessons this week to learn from the past, there will also be lessons from this week to carry forward. New Orleans is hardly the only example of America's admirable hubris. Many of its greatest man-made miracles are built on precarious natural foundations. What happened to the Gulf coast this week, will one day happen—in a different way—to Silicon Valley, Miami, Los Angeles or any of the other places that triumphantly defy geography in one way or another. There will always be more disasters; with luck they will not catch America as unprepared as Katrina did.

And in another article in the same volume (September 3–9, 2005, 28):

> The region was probably not helped by planning regulations either. Put simply, too many homes on the Gulf coast have been built in areas that are susceptible to flooding; and the developers who put them up did not contribute enough to flood-control systems. In most other catastrophes of this sort, there is usually a paper trail of building permits given rather too easily by local authorities to favoured builders. It is hard to believe that the Big Easy—no stranger to political graft—will be any different.

The *New York Times* and the *Washington Post* also printed several hard-hitting articles. Although slightly out of our 30-day window, our first example comes from the *New York Times* Science Desk—"Some Experts Say It's Time to Evacuate the Coast (for Good):"

> As the Gulf Coast reels from two catastrophic storms in a month, and the Carolinas and Florida deal with damage and debris from hurricanes this year and last, even some supporters of coastal development are starting to ask a previously unthinkable question: Is it time to consider retreat from the coast?
>
> Yes, said Howard Marlowe, president of Marlowe & Company, a lobbying firm that represents counties and local governments, often in seeking support for coastal infrastructure, like roads, sewers, and beach replenishment. "I think we need to be asking that and discussing that, and the federal government needs to provide leadership," Mr. Marlowe said. He added, "I have never been an advocate for the federal government telling people that they have to move out, but it's important to have a discussion at all levels of government about what can be done to make sure more people do not put themselves in harm's way. It will not be an easy dialogue."
>
> The idea that much of the coast is dangerous and getting more so is not new. Coastal scientists have been saying for years that global warming will threaten coastal areas with higher seas and more powerful storms, and that a hurricane lull that began in the mid-1960s will eventually give way to the far more dangerous pattern of storms that prevailed in the 1930s, 40s and 50s. Since then, though, development has transformed the nation's shoreline, especially on the east and gulf coasts. . . .
>
> Erosion already threatens 70 percent of the nation's coastline, and is especially severe on the east and gulf coasts. In a report to Congress in 2000, the Federal Emergency Management Agency said that more than a quarter

> of the houses within 500 feet of the coast might be lost to the sea by 2060. The report said these losses would put an intolerable burden on the federal government, which insures many of the structures through its flood insurance program.
>
> "We are getting these lifetime storms every couple of years," said Riley G. Hoggard, a resource management specialist at the Gulf Islands National Seashore, where the road to Fort Pickens, on Santa Rosa Island here, has been washed out and rebuilt three times in the last year. "Maybe we need to get into a program of orderly retreat" (October 4, 2005).

On September 4, 2005, Ellen Ruppel Shell, of the *Washington Post* wrote "Nature's Wrath, Man's Mistakes; Our Hubris and Folly," early on cutting to the bone:

> Americans love heroes, and there is nothing more appealing to politicians, including presidents, than comforting victims of national disasters with promises of resources and money. But these dollars are rarely earmarked for mitigation measures, such as bolstering coastal flood plains and wetlands around New Orleans to provide some degree of natural defense. Nor do these efforts often lead to a spurt of regulations to help prevent the damage from occurring again. This is not due to a lack of understanding—government officials know full well that humans were not meant to build on flood plains. They also know that overdevelopment creates huge swaths of impermeable surfaces like roads and parking lots, giving water no place to go, and making even moderate flooding more dangerous. But when faced with a developer who might contribute to the community's tax base, these same officials rarely have the strength to insist on sensible measures.

The *Washington Post* dedicated an editorial (September 9, 2005), "Learning From Katrina," to the problem of coastal development. The piece is worth quoting at length because it correctly blames current vulnerabilities on past policy decisions:

> In 1969, Hurricane Camille destroyed coastal homes in Mississippi and Louisiana, wiping out much of the area, including Biloxi. But government policy after Camille—as with government policy after major East Coast hurricanes—amounted, in the words of one expert, to an "urban development program." Instead of shrinking, coastal development expanded. In truth, local and federal policies, ranging from beach preservation subsidies to zoning laws, have long encouraged building homes along coasts that are unusually susceptible to flooding and wind. Even the National Flood Insurance Program, set up in 1968 to offer government-subsidized

> flood insurance to susceptible communities in exchange for strict zoning and construction regulations, is at fault. Over the past two decades, the regulatory force of the law has been substantially weakened. All that is left in many places is the subsidy, which thousands of homeowners collect over and over again.
>
> Elsewhere in the country, government programs to acquire property in flood plains have successfully persuaded people to leave them. After the Mississippi River floods of 1993, the town of Valmeyer, IL, was moved in its entirety, away from the river and onto a surrounding bluff. After Hurricane Floyd in 1999, the city of Kinston, NC, moved entire neighborhoods out of flood plains and revitalized the city as well. But the political power of wealthy beachfront property owners has prevented such programs from being implemented along the coasts. That must not be allowed to happen again.

At the local (impact area) level, we identified only a few stories questioning the dominant growth model of U.S. coastal development. While Mississippi Governor Haley Barbour was calling for a coastal "renaissance" and legislation was being considered that would allow the floating casinos to move inland, the Biloxi *Sun Herald* advocated reorienting coastal development policy:

> All persons on the Coast are focused on preserving human life and easing human suffering. Clearly, those are the most critical matters at this point. However, everyone's attention will eventually turn to rebuilding the coast. Simply replacing the infrastructure would be a serious mistake. Instead, the Coast should be redesigned (September 16, 2005).

Conclusion

Given our 30-day time frame for analysis, we recognize that our conclusions are tentative and require deeper and more extended study. Ideally, we would look at media coverage for at least 12 months, adhere to a more detailed coding method, examine the interrelationships of public, institutional, and decision agendas, and compare disaster cases where land use and wisdom failures figured prominently. Nonetheless, the sharp contrast between national and local media on causal attributions suggests an interesting postdisaster rule: The farther a media outlet is from the arena where mitigation and land use decisions are made, the more willing it is to question dominant growth models and raise fundamental wisdom failure questions. This may sound tame and even banal, but consider the inverse: The closer a media outlet is to the arena where core mitigation and land use decisions are made, the less willing it is to question growth models and raise fundamental

vulnerability issues, which then affects the entire public discourse on reconstruction values and strategies. This "inverseness" rule, which we might call the Distance-Courage Relationship, helps explain why local (and highly relevant) media are so loath to bring up building code and especially land use issues while national and foreign media (famously irrelevant locally) are relatively freer. Consequently, discussions of all-important land use issues tend to be muted locally and, with local public agendas so constrained, it should be small wonder that the "We Will Rebuild" mentality leads to local government reconstruction policies and programs that literally replicate (albeit with some code and site-specific tweaks) the more general vulnerabilities that brought on the disaster in the first place. More pointedly, reconstruction without major re-visioning of the entire community literally declares recently suffered losses as "acceptable" without posing the question, "acceptable to whom?"

Notes

1. The *Sun Herald* produced a book, *Katrina: Eight Hours that Changed the Mississippi Coast Forever*. *Sun Herald* publisher Rick Matthews said, "We're in a unique position to not only capture the story of Katrina but to help the rest of the world understand that Katrina's impact on the Mississippi Gulf Coast was the largest natural disaster in the United States, independent of New Orleans," (*Sun Herald*, Nov. 16, 2005).

2. In fact, along with the *Times-Picayune*, the *Sun Herald* shared the 2006 Pulitzer Prize for Public Service, "for its valorous and comprehensive coverage of Hurricane Katrina, providing a lifeline for devastated readers, in print and online, during their time of greatest need."

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